

WHITE

by MTD

OWNER'S GUIDE

WIDE CUT MOWER

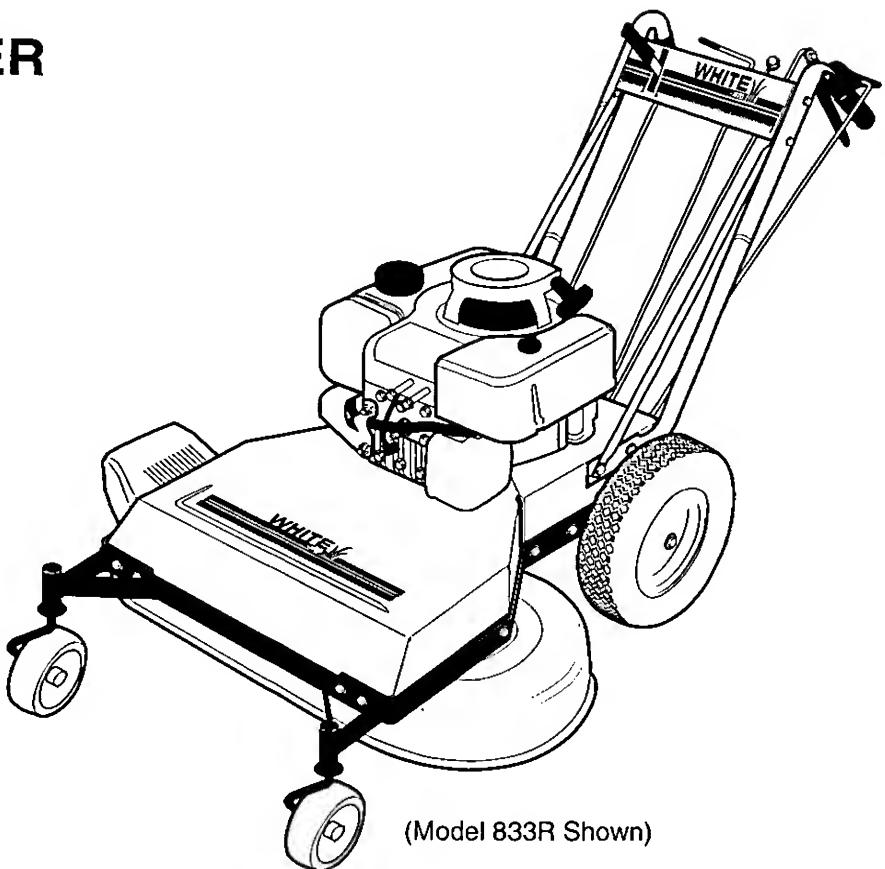
Model Series

833R

(12A-750-190)

833E

(12AE750-190)



IMPORTANT: READ SAFETY RULES AND INSTRUCTIONS CAREFULLY

Warning: This unit is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush-covered or grass-covered land unless the engine's exhaust system is equipped with a spark arrester meeting applicable local or state laws (if any). If a spark arrester is used, it should be maintained in effective working order by the operator. In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. A spark arrester muffler is available through your nearest engine authorized service dealer or contact the service department, P.O. Box 368022 Cleveland, Ohio 44136-9722.

MTD PRODUCTS INC. P.O. BOX 368022 CLEVELAND, OHIO 44136-9722

Dear Owner:

You now own one of the finest walk-behind mulching/side discharge mowers available.

Your new White Outdoor Wide Cut Mower allows you to mow much faster than the usual walk-behind mower because of its wide 33" cut. Differential steering makes turning easy, while four forward speeds and one reverse speed allow precise mowing control. The wide turf tires give excellent traction without leaving wheel marks, and the cutting height can be adjusted with the turn of a single lever. We know that there is no better walk-behind mower that is available for large lawns.

Please carefully read this Owner's Guide which tells you how to safely and easily assemble, operate and maintain your machine.

Be sure that you and any other user carefully follow the recommended safety practices at all times. Failure to do so could result in personal injury or property damage.

If you have questions regarding the operation or maintenance of this machine, or desire information not found in this Owner's Guide, contact your local White Outdoor Dealer. If you need help locating a dealer, contact the MTD Customer Support Department.

This product is certified to comply with ANSI Standard B71.1 – 1996. All products in this Owner's Guide meet the latest CPSC blade safety requirements.



This is a safety alert symbol. It is used in this Owner's Guide to alert you to potential hazards. When-

ever you see this symbol, read and obey the safety message that follows it. Failure to obey the safety message could result in personal injury or property damage.



WARNING

The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm.



Table of Contents

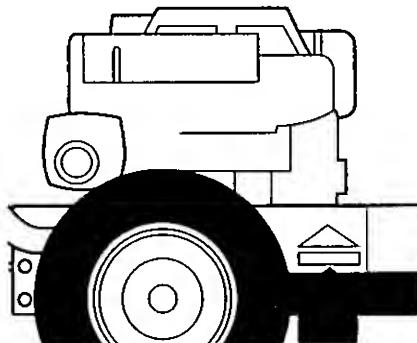
Owner's Record

Please write the Model Number and Serial Number of your machine in the spaces provided. You can find the location of these numbers by referring to the illustration below.



Model Number:

Serial Number:



Model/Serial
Number
Location

Dealer Information

Dealer Name

Address

Phone

Date Purchased

Product Description

SERVICE INFORMATION	2
SECTION 1: SAFETY	3
Training	3
Preparation	3
Operation	4
Maintenance and Storage	5
Decals	6
SECTION 2: ASSEMBLY	7
SECTION 3: FEATURES AND CONTROLS	14
Operating Symbols	14
Operator Presence Control	14
Blade Drive Control	15
Gear Select Lever	15
Wheel Drive Control	16
Cutting Height Control Lever	16
Mulcher Cover	16
Engine Throttle Control	17
Ignition/Starter Switch	17
Engine Recoil Starter	17
SECTION 4: OPERATION	18
Before Operating	18
Fill Fuel Tank	19
Adjust Mower Cutting Height	19
Select Mulching or Side Discharge Mowing	20
Moving the Mower Without Engine Power	20
Starting and Stopping the Engine	20
Engaging the Blades	21
To Engage the Wheels	22
Making Turns	22
Mowing Tips and Hints	23
Blade Brake Control Test	24
SECTION 5: MAINTENANCE	25
Engine Oil Service	25
Engine Cleaning	26
Air Cleaner Service	26
Spark Plug	27
Battery	27
Carburetor	27
Engine Storage	27
Tipping Mower for Service	27
Belt Cover Removal	28
Blade Spindle Belt Replacement	28
Blade Drive Belt Replacement	28
Blade Brake Replacement	29
Blade Drive Adjustment	30
Blade Drive Control Lever Adjustment	30
Wheel Drive Belt Replacement	30
Wheel Drive Belt Adjustment	31
Wheel Brake Adjustment	32
Transmission Neutral Adjustment	32
Mower Blades	33
Cleaning Underside of Mower Deck	34
Lubrication	35
Off-Season Storage	35
Maintenance Chart	36
Troubleshooting Chart	37

Section

Safety

Read Me First!

Please read and follow all of the safety rules in this Safety Section. Failure to comply could result in serious personal injury or property damage.

If you should lend this equipment to another person, make sure that he or she reads, understands, and always follows these safety instructions.

If you are not completely sure about any of the information found here or elsewhere in the Owner's Guide, please contact your local White Outdoor Dealer.



This is a safety alert symbol. It is used in this Owner's Guide and on your machine to alert you to potential hazards.

Whenever you see this symbol, read and obey the safety message that follows it. Failure to obey the safety message could result in personal injury or property damage.



WARNING TO ALL CALIFORNIA AND OTHER POWER EQUIPMENT OPERATORS



Under California law, and under the laws of several other states, you are not permitted to operate an internal combustion engine using hydrocarbon fuels on any forest covered, brush covered, or grass covered land, or on land covered with grain, hay, or other flammable agricultural crop, without an engine spark arrester in continuous effective working order.

The engine on your power equipment, like most outdoor power equipment, is an internal combustion engine that burns gasoline, a hydrocarbon fuel. Therefore, your power equipment must be equipped with a spark arrester muffler in continuous effective working order. The spark arrester must be attached to the engine exhaust system in such a manner that flames or heat from the system will not ignite flammable material. Failure of the owner/operator of the equipment to comply with this regulation is a misdemeanor under California law, and may also be a violation of other state and/or federal regulations, laws, ordinances, or codes. Contact your local fire marshal or forest service for specific information about what regulations apply in your area. Contact your authorized engine dealer for information about obtaining a spark arrester.

IMPORTANT

Safe Operation Practices for Walk-Behind Mowers

This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

I. GENERAL OPERATION

1. Read, understand, and follow all instructions on the machine and in the Owner's Guide. Be thoroughly familiar with the controls and the proper use of the equipment before starting.
2. Do not put hands or feet near or under rotating parts. Keep clear of the mower blade and discharge opening at all times.



3. Only allow responsible individuals, who are familiar with the instructions, to operate the mower.

4. Clear the area of objects such as rocks, toys, wire, bones, sticks, etc., which could be picked up and thrown by the blade.



5. Be sure the area is clear of other people before mowing. Stop mower if anyone enters the area. Keep bystanders at least 25 feet away from the area of operation.

Safety

6. Do not operate the mower when barefoot or wearing open sandals. Always wear substantial footwear.
7. Do not pull mower backwards unless absolutely necessary. Look down and behind before and while moving backwards.
8. Do not operate the mower without proper guards, plates, grass catcher or other safety protective devices in place.
9. Refer to provided instructions for proper operation and installation of accessories. Only use accessories that are factory-approved.
10. Stop the blade when crossing gravel drives, walks, or roads.



11. Stop the engine and disconnect the spark plug wire from the spark plug whenever you leave the unit, before cleaning the mower or unclogging the chute.
12. Shut the engine off, wait until the blade comes to a complete stop, and disconnect the spark plug wire before installing or removing the mulcher cover or the optional grass catcher. Make certain that the grass catcher is securely attached before operating the mower. Empty the grass catcher after each use—decomposing debris could generate enough heat to catch fire.
13. Mow in daylight or good artificial light.
14. Do not operate the mower while under the influence of alcohol or drugs.

15. Never operate mower in wet grass. Always be sure of your footing; keep a firm hold on the handle and walk; never run.
16. Disengage the Wheel Drive Lever on self-propelled models before starting the engine.
17. If the unit should start to vibrate abnormally, stop the engine and disconnect the spark plug wire. Then check immediately for the cause. Vibration is generally a warning of trouble.
18. Always wear safety goggles or safety glasses with side shields when operating mower.
19. Watch for traffic when operating near, or when crossing roadways.
20. Never attempt to carry children or other passengers on the mower. They could fall off and be seriously injured, or they could interfere with the safe operation of the mower.
21. Check the operation of the Operator Presence Control Bar before each use. See the Maintenance Section of this Owner's Guide for instructions. If the engine runs longer than three seconds after the Operator Presence Control Bar is released, the system is not working properly. Immediately contact your local White Outdoor Dealer for instructions. Do not use the mower until the mechanism is repaired.
22. The mower is equipped with a safety discharge chute, comes with a special mulcher cover, and offers an optional grass catcher. The safety discharge chute must be working properly at all times. Never attempt to disconnect or otherwise cause this discharge chute to cease working. If used, mulcher cover or grass

catcher attachment must be installed properly and function correctly. Do not use your equipment otherwise.

23. Never run the engine in an enclosed area. Engine exhaust contains carbon monoxide, a deadly gas that is odorless, colorless, and tasteless. Always run the engine outdoors and make sure there is adequate ventilation.

II. SLOPE OPERATION

Slopes are a major factor related to slip and fall accidents which can result in severe injury. All slopes require extra caution. If you feel uneasy on a slope, do not mow it.



DO:

Mow across the face of slopes; never up and down. Exercise extreme caution when changing direction on slopes. Avoid slopes greater than 15°.

Remove objects such as rocks, tree limbs, etc.

Watch for holes, ruts, or bumps. Tall grass can hide obstacles.

DO NOT:

Do not mow near drop-offs, ditches, or embankments. The operator could lose footing or balance.

Do not mow excessively steep slopes.

Do not mow on wet grass. Reduced footing could cause slipping.

III. CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the mower and to the mowing activity. *Never assume that children will remain where you last saw them.*

1. Keep children out of the mowing area and under the watchful care of a responsible adult.
2. Be alert and turn mower off if children enter the area.
3. Before and while moving backwards, look behind and *down* for small children.
4. Never allow children to operate the mower.
5. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

IV. SERVICE

1. Use extra care in handling gasoline and other fuels. They are flammable and their vapors are explosive.
 - a) Use only an approved container.
 - b) Never remove gas cap or add fuel when the engine is running. Allow engine to cool before refueling. Do not smoke.
 - c) Never refuel the machine indoors.
 - d) Never store the machine or fuel container inside where there is an open flame, such as a water heater, etc.
 - e) Move mower away from any gasoline fumes before starting the engine.
2. Never run an engine inside a closed area.

3. Never make adjustments or repairs with the engine running. Disconnect the spark plug wire and keep the wire away from the plug to prevent accidental starting.
4. Keep all nuts and bolts, especially the blade attachment bolts, tight and keep equipment in good condition.
5. Never tamper with safety devices. Check their operation regularly.
6. Keep mower free of grass, leaves or other debris build-up. Clean up oil or fuel spillage. Allow mower to cool before storing.
7. After striking an object, stop the engine and disconnect the spark plug wire. Inspect the mower and repair, if necessary, before restarting.
8. Never attempt to make mower cutting height adjustments while the engine is running.
9. Grass catcher components are subject to wear, damage and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with factory recommended parts, when necessary.
10. Mower blades are sharp and can cut. Wrap the blade or wear gloves, and use extra caution when servicing them.
11. Do not change the engine governor setting or overspeed the engine.
12. Do not touch engine parts which may be hot from operation. Allow parts to cool completely before inspecting, cleaning or repairing the mower.
13. To access the underside of the mower, tip the mower rearward. Do not tip the mower forward or on either of its sides, unless specifically advised to do so in this Owner's Guide.
14. Maintain or replace safety and instructional decals. Refer to the separate Parts Book for replacement decal information.
15. For units equipped with electric start:
 - a) Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc., away. Ventilate the area when charging the battery. Do not charge the battery in an airtight space.
 - b) Do not use a battery charger other than the one provided with the mower.
 - c) The battery contains toxic materials. Do not damage the battery case. If the case is broken or damaged, avoid contact with the battery contents.
 - d) Properly dispose of a damaged or worn out battery. Check with local authorities for proper disposal methods.
 - e) Do not short circuit the battery. Severe burns and fire can result.



Safety

SAFETY DECALS

Make certain all safety decals on this equipment are kept clean and in good condition. The decals are shown (at reduced sizes) below. If you need a replacement decal, please refer to the Parts Book that accompanied this Owner's Guide.



On top, rear of engine platform

CAUTION

PINCH POINTS.

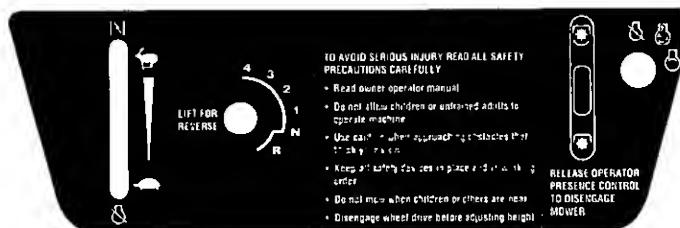
Do not operate without all belt guards in place.



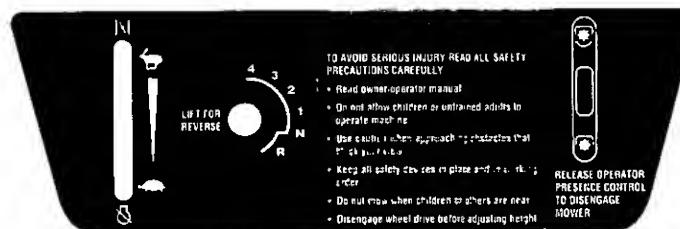
Beneath belt/pulley cover



On left side of mower deck



On Control Panel (for electric start model)



On Control Panel (for recoil start model)

Section

2

Assembly

Read Me First!

Please carefully follow the instructions in this Section to properly prepare your new machine for use. Remember that motor oil must be added to the engine before starting.



WARNING

To prevent personal injury or property damage, do not attempt to start the engine until all assembly steps are complete and you have read and understand the safety and operating instructions in this Owner's Guide.

Supplies Needed:

- Wire Cutter
- 7/16" Wrench
- 3/8" Wrench
- Two 1/2" Wrenches
- Scissors or Pen Knife
- Needle-nose Pliers
- Motor Oil (see Step 5)
- Tire Gauge

NOTE: All references to left, right, front and rear of the machine are determined by standing behind the handlebars and facing in the direction of forward travel.

Subjects covered in this Section:

- Inspection After Delivery
- Unpacking Mower
- Attaching Handlebars and Control Rods
- Preparing Electric Start Model
- Filling Engine Crankcase with Oil



WARNING

To prevent personal injury or property damage, do not attempt to start the engine until all assembly steps are complete and you have read and understand the safety, controls, and operating instructions.

INSPECTION AFTER DELIVERY

While unpacking the machine, inspect for shipping damage or missing parts. If you find any damage, or if parts are missing, notify the White Outdoor Dealer who sold you the machine.

IMPORTANT: Motor oil must be added to the engine before starting. The correct procedure for adding motor oil to the oil fill area is explained in Section 2: Assembly, Step 5.

ASSEMBLY STEPS

STEP 1: Unpacking Mower

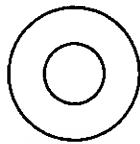
1. Cut plastic banding with scissors. Open box flaps and remove liners. Remove any staples securing bottom of carton to wood pallet. Lift off carton. Cut metal straps securing unit to base. Leave unit on base of pallet during assembly steps (to safely remove unit from base, wait until you have completed assembly steps 1-4).
2. Remove and open hardware bag. Check contents of bag against

illustrated parts list on next page. Unless otherwise noted, all items are shown at actual size.

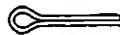
3. Cut plastic tie straps holding four long control rods to handlebars. Two long tubular steel handlebar struts may be attached (at one end) to the top of the handlebars or may be shipped loose. Assembly instructions for the struts are provided. Also remove any packaging around handlebars.

Assembly

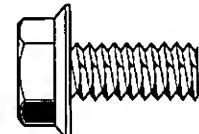
Figure 2-1 – Contents of Hardware Bag



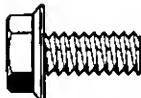
**Flat Washer,
5/16”
Qty: 4**



**Cotter Pin,
3/32” x 5/8”
Qty: 6**



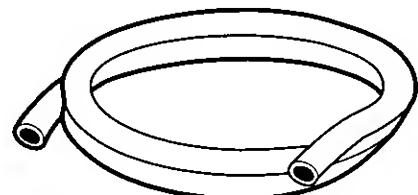
**Hex Flange Lock Screw,
5/16”-18 x 3/4”
Qty: 2**



**Hex Flange Lock Screw,
1/4”-20 x 1/2”
Qty: 2**



**Hex Flange Lock Nut,
1/4-20”
Qty: 2**



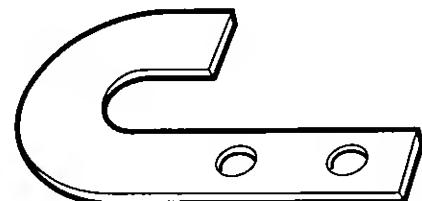
**Oil Drain Tube (shown reduced size)
Qty. 1
(used for changing oil - see Maintenance
Section of this Manual for instructions)**



**Shift Link - Gear Select Lever
(shown reduced size)
Qty: 1**



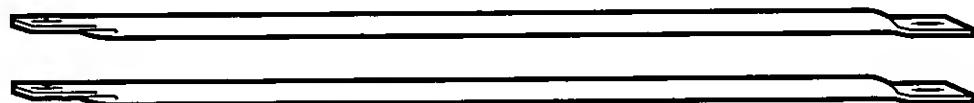
**Plastic Cable Tie
(shown reduced size)
Qty: 1 (Recoil Start Model)
Qty: 3 (Electric Start Model)**



**Shift Rod Mounting Plate
(shown reduced size)
Qty: 1**

Shipped in Carton:

**Handlebar Struts- Qty: 2
(may be partially installed
or shipped loose)
[shown reduced size]**



(Parts shown below are for electric start model only)



**Battery Charger
(shown reduced size)
Qty: 1**

**Ignition Keys (not illustrated)
Qty: 2
(store in safe place)**

STEP 2: Attach Handlebars to Engine Deck

1. Cut and remove any plastic tie(s) holding wheel drive rod (F, Figure 2-7) to left handlebar and blade drive rod (C, Figure 2-7) to right handlebar. Put rods aside.
2. Remove and save two 5/16" screws securing ends of handlebars to engine deck. To free handlebars from shipping position, raise the two handlebar struts (A, Figure 2-2B) to a 45° angle. From front of machine, tilt right-side handlebar up over engine air cleaner and then lift other handlebar upward. Rotate handlebars over engine and position bottom of handlebars against sides of deck (see E, Figure 2-2B).
3. If tops of struts (A, Figure 2-2A) are connected to the handlebar control panel (B), go to next step. If not connected, remove nut "C" (Figure

2-2A) on both sides of control panel (B). Place strut ends with small holes (flared side inward) on bolts. Replace nuts loosely.

NOTE: Four screws (D, Figure 2-2B) are used to connect the handlebars to the engine deck. The screws thread into lock nuts welded to the back sides of the deck.

4. Swing the struts to 45° forward. Align the handlebar ends (E, Figure 2-2B) with the holes in the engine deck. Install two 5/16" hex flange screws (D, Figure 2-2B) into the *rear* holes and tighten.
5. Position both struts (A, Figure 2-2B) so the ends are aligned over the *front* holes in the handlebar ends. Secure the struts and handlebars with two 5/16" hex flange screws. Tighten all four screws. Tighten nuts "C."
6. Secure the engine throttle cable to the left handlebar with a cable

tie from the hardware bag. Clip off excess tie length.

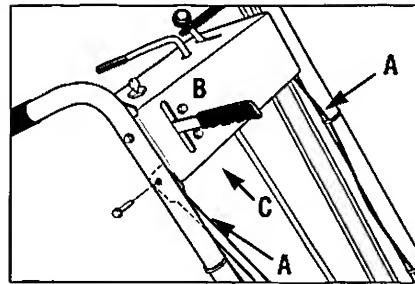


Figure 2-2A: Connect tops of struts to sides of control panel (unless done at factory).

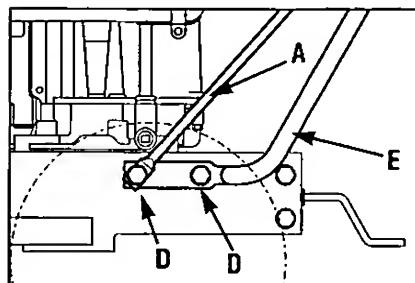


Figure 2-2B: Attach handlebars and bottom of struts to engine deck.

STEP 3: Electric Start Model

A. Route and Secure the Wire Harness

1. Plug wire harness into bottom of ignition keyswitch on console (not pictured).
2. Use cable ties provided in hardware bag to secure electrical wire harness (leading from keyswitch) to right handlebar, away from any moving parts. Place cable ties an equal distance apart on handlebar.

B. Attach Wire Leads to Battery

1. Battery is located at rear, right-side of engine deck.
2. Locate wiring harness that leads from ignition keyswitch on underside of handlebar console. At the lower end of the wiring harness locate a red wire lead and a black wire lead.

- Plug terminal on red (positive) wire into red terminal (U, Figure 2-3) on battery.
- Plug terminal on black (negative) wire into black terminal (V, Figure 2-3) on battery.



WARNING

Charge battery only with charger supplied with machine. Do not short circuit battery wires. Remove any jewelry before working on or near the battery or electric start system. Failure to follow these instructions could result in personal injury or property damage.

3. If applicable, secure wire harness in place on deck with pre-installed J-clips (W, Figure 2-4). Insert wire harness into J-clips as shown in Figure 2-4, bending J-clips over to retain harness.

C. Battery Charging

A new battery should be charged for 24-48 hours to ensure a full charge. If the mower must be used immediately, the battery may have enough charge to start the engine. If not, the engine can be started with the rope pull starter.

Charge the battery after initial use of mower to ensure it is charged.

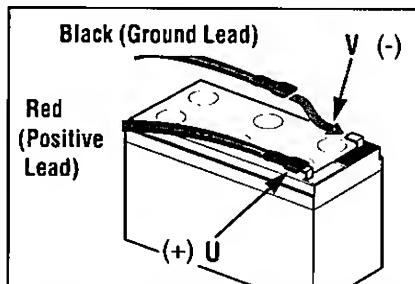


Figure 2-3: Connect wire terminals to battery terminals.

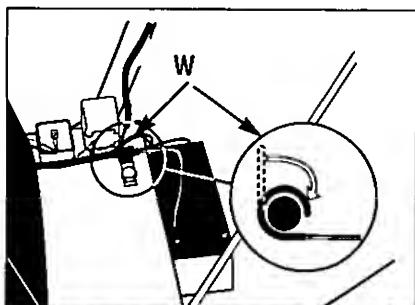


Figure 2-4: Wire harness secured by J-clips.



CAUTION

If battery is removed, do not operate engine without insulating positive (+) battery cable terminal with electrical tape or sparking from battery cells can result.

Assembly

1. To charge the battery, locate the connector (T, Figure 2-5) that hangs from the wire harness below the handlebar console.
2. Plug the connector on the battery charger (Z, Figure 2-5) into the connector on the wire harness (T).
3. Plug battery charger into 120V grounded wall outlet. **NOTE:** Battery charger is designed for use indoors and should not be exposed to rain or snow.
4. Charge battery for 24-48 hours.
5. After charging, unplug battery charger from wall outlet, then unplug charger from connector on wire harness.

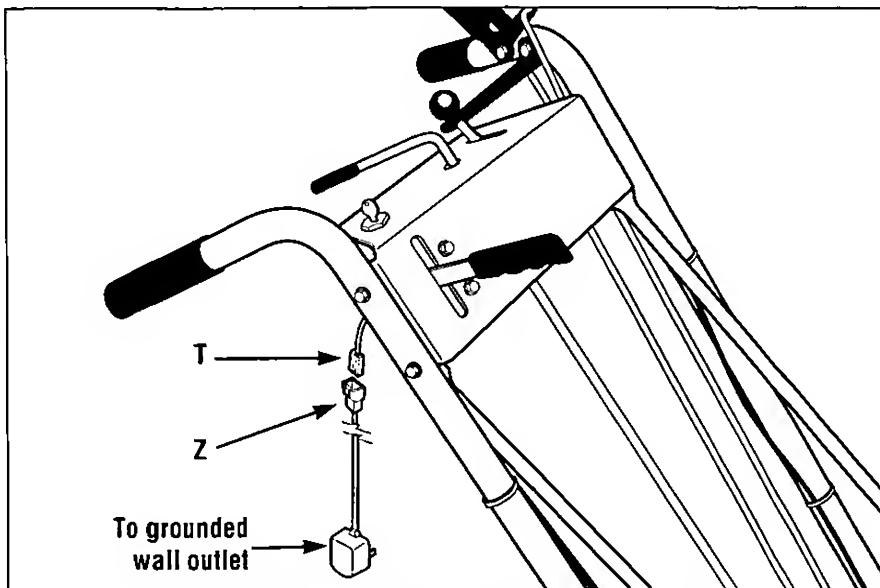


Figure 2-5: Connect battery charger terminal to wire harness terminal.

STEP 4: Attach Control Rods



WARNING

Control rods are adjusted at the factory and should not require additional adjustment during assembly. After assembling unit, control rod adjustment should be checked (and re-adjusted, if necessary) according to information in Maintenance Section. Severe personal injury or property damage could result from not following this instruction.

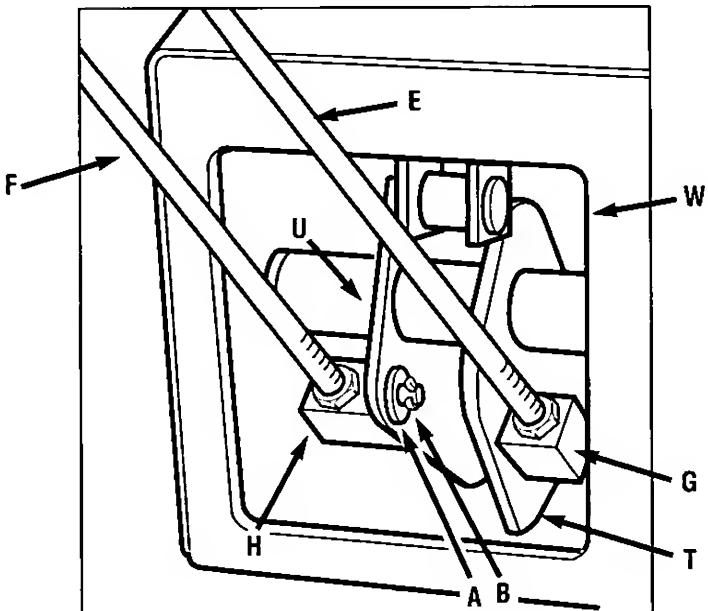


Figure 2-6: Left-hand control rods in detail.

A. Attach Wheel Drive Control Rod

1. Locate the wheel drive control rod (F, Figures 2-6 & 2-7) that you removed from the left handlebar in Step 2. This rod has a swivel block (H, Figure 2-6) on one end.
2. At left side of engine frame, insert swivel block (H, Figures 2-6 & 2-7) on wheel drive control rod into wheel drive control arm (U, Figure 2-6).

3. Add one 5/16" washer (A, Figure 2-6). Secure with cotter pin (B, Figure 2-6). Bend ends of cotter pin to secure the rod.

4. At upper end of control rod, secure angled end to Wheel Drive Control lever (V, Figure 2-6A), using a cotter pin (BB). Bend ends of cotter pin to secure.

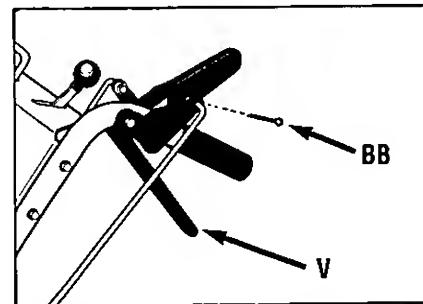


Figure 2-6A: Attach wheel drive control rod to control lever.

B. Attach Operator Presence Control Rod:

1. Locate control rod (E, Figures 2-6 & 2-7) attached at upper end to Operator Presence Control (W, Figure 2-7). Add one 5/16" washer and secure with cotter pin. Bend ends of cotter pin to secure.
2. At bottom of control rod, insert swivel block (G, Figures 2-6 & 2-7) into control arm (T, Figure 2-6).
3. Add one 5/16" washer and secure with cotter pin. Bend ends of cotter pin to secure.

C. Attach Blade Drive Control Rod:

1. Locate the blade drive control rod (C, Figure 2-7) that you removed in Step 2. Insert one end of control rod into blade drive bracket (D, Figure 2-7). Add one 5/16" washer and secure with cotter pin (CC). Bend ends of cotter pin to secure.
2. Insert upper end of rod into bottom end of Blade Drive Control lever (J). Add one 5/16" washer and secure with cotter pin (AA). Bend ends of cotter pin to secure.

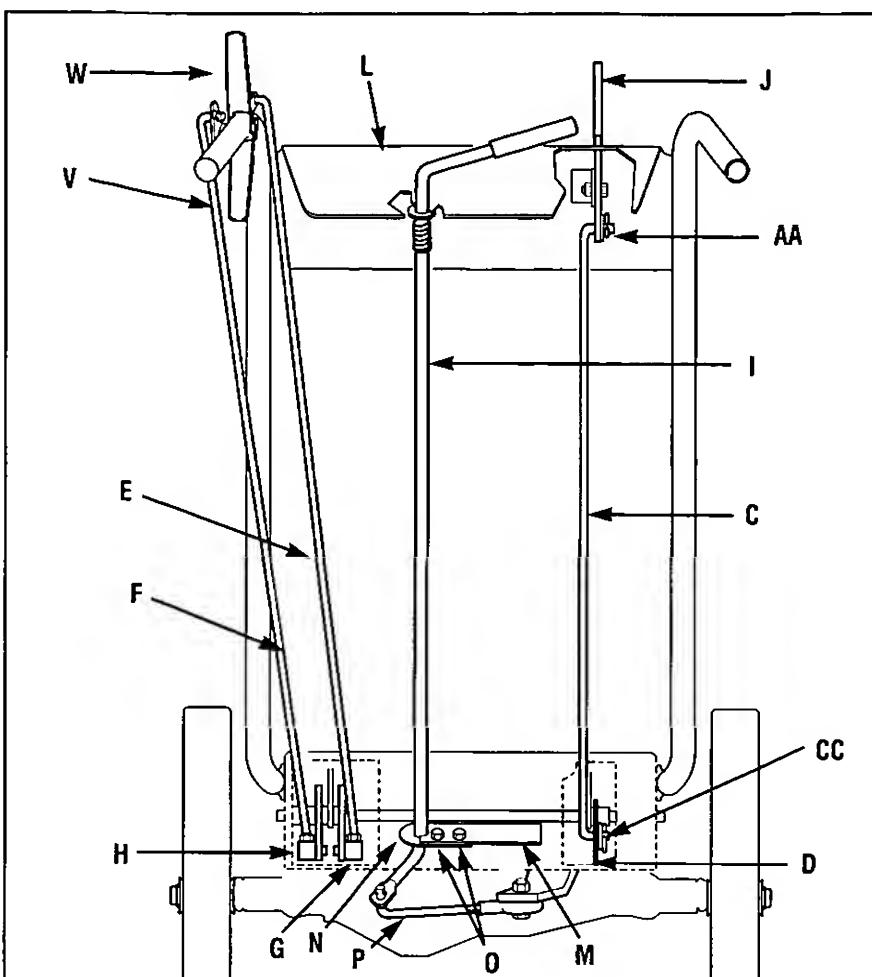


Figure 2-7: Rear view of control rods.

D. Attach and Adjust Gear Select Lever:

1. Using the edge of a piece of flat wood (such as a ruler), remove the vinyl grip (B, Figure 2-8) from the gear select lever (I). Place the wood edge against the edge of the grip and slowly pull off the grip.
2. Insert nylon bushing (Z, Figure 2-8) up into console (L).
3. Slide spring and washers (J) down onto gear select lever.
4. Insert gear select lever (I) up through nylon bushing (Z) in handlebar console (L, Figure 2-8). Guide pin (K) on gear select lever into groove in shift quadrant (P).

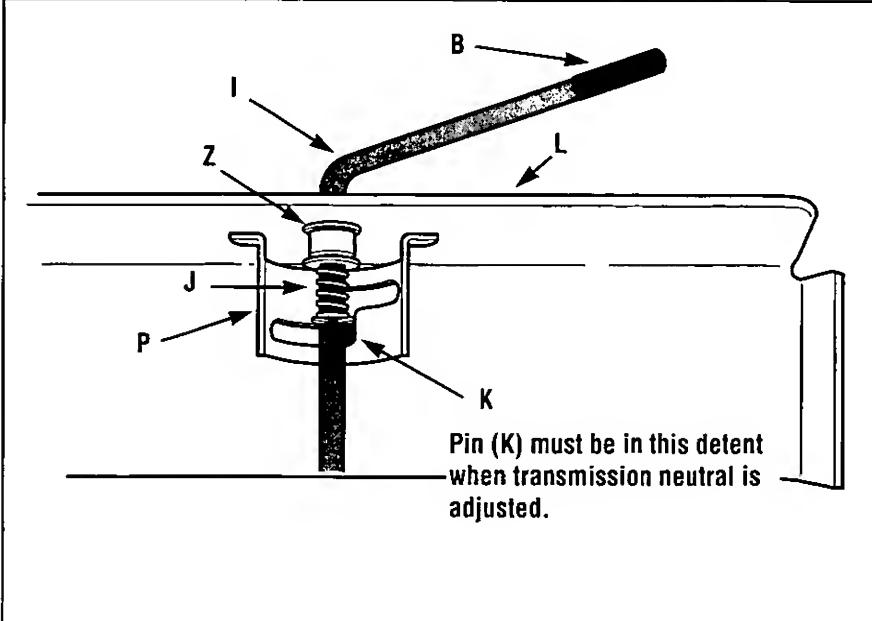


Figure 2-8: Detail – Gear Select Lever in Neutral (N) position.

Assembly

5. Hold lower part of gear select lever (I) against bracket (M, Figure 2-9). Position retaining plate (N) from parts bag in place as shown in Figure 2-9 (plate below bracket). Secure plate with two 1/4"-20 x 1/2" long screws (O) and 1/4"-20 locknuts.

6. Slide grip (B, Figure 2-8) back onto upper end of gear select lever (I).

7. Rotate gear select lever (I, Figures 2-8 & 2-9) clockwise until spur (K - short rod) on gear select rod stops in the neutral position detent on the shift pattern quadrant (Figure 2-8).

8. At bottom of control rod, thread shift link (P, Figure 2-9) partially into ball-joint (Y).

9. Move shift arm (X, Figure 2-9) from side to side as necessary into each transmission gear detent until transmission is in neutral.

NOTE: Moving shift arm (X) all the way to the left, and then one notch back to the right, should put transmission into neutral. When transmission is in neutral, unit will move freely when pushed while holding the Operator Presence Control lever (W, Figure 2-7) down. If transmission is NOT in neutral, there will be a slight drag on the wheels when pushing unit.

10. When shift arm (X) is in neutral position, rotate shift link (P) toward end of gear select lever rod (I). Adjust length of shift link (P) as necessary to fit into hole in bottom of gear select lever (I).

NOTE: Pin (K) on Gear Select Lever (I) must be held in the neutral position detent on the shift quadrant (see Figure 2-8) while shift link (P, Figure 2-9) is adjusted.

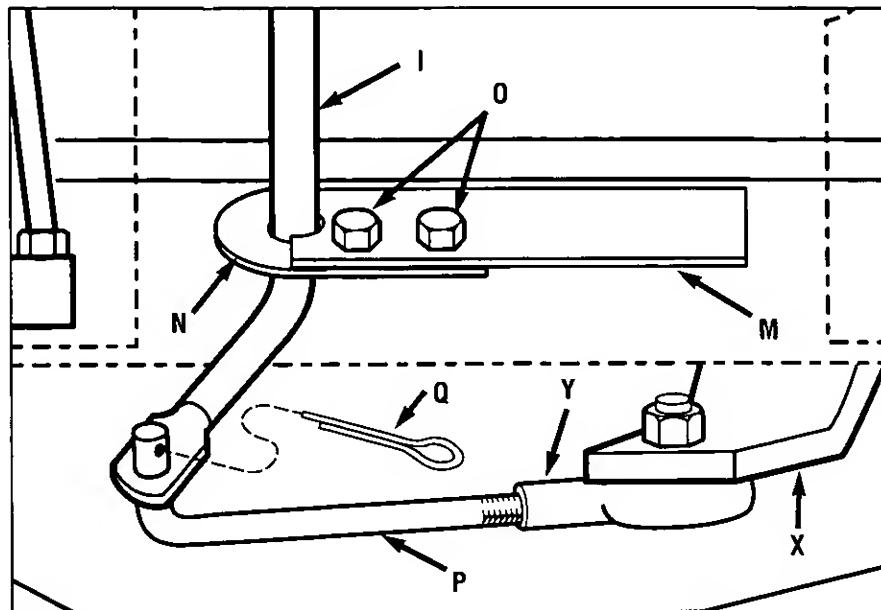


Figure 2-9: Detail – Transmission Neutral Adjustment.

11. Insert hooked end of shift link (P, Figure 2-9) into hole in bottom end of gear select lever (I) and secure with cotter pin (Q). Bend ends of cotter pin. **NOTE:** It may be necessary to lift gear select lever (I) to install shift link (P).

12. Remove unit from shipping crate. To remove, hold down Operator Presence Control lever (W, Figure 2-7) which releases the wheel brake.

13. Hold down Operator Presence Control lever (W, Figure 2-7) and push unit forward and backward. The wheels should move freely. If not, adjust length of shift link (P, Figure 2-9) as necessary.

14. Put the Gear Select Lever in neutral (N), release all of the control levers, and try to push the unit forward and backward. The wheels should not turn. If they do turn, an adjustment is necessary. **DO NOT OPERATE THE UNIT UNTIL THE WHEEL BRAKE MECHANISM HAS BEEN ADJUSTED AND IS WORKING PROPERLY.** See "Wheel Brake Adjustment" in Section 5 "Maintenance."



WARNING

Do not use the mower if the wheels continue to turn after releasing the Operator Presence Control and the Wheel Drive Control. Severe personal injury or property damage could result if this instruction is not followed.



WARNING

Control rods are adjusted at the factory and should not require additional adjustment during assembly. After assembling unit, control rod adjustment should be checked (and re-adjusted, if necessary) according to information in Maintenance Section. Severe personal injury or property damage could result from not following this instruction.

STEP 5: Fill Engine Crankcase with Oil



CAUTION

- Unit is shipped without oil in engine crankcase. DO NOT start engine until oil has been added. Severe engine damage will result if this instruction is not followed.

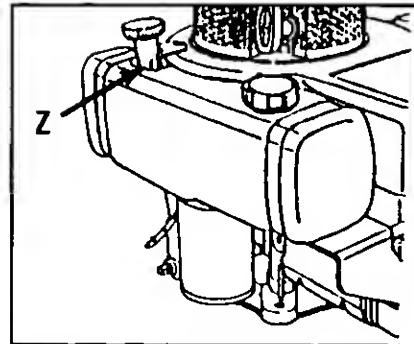


Figure 2-10: Engine oil fill.

To add oil:

- Move mower to a level area. Press and hold down Operator Presence Control lever (W, Figure 2-7) to move mower.
- Refer to chart (Figure 2-11) to determine proper engine oil. Refer to separate Engine Operator/Owner Manual for amount of oil required (always use dipstick to determine whether crankcase is properly filled).
- Remove dipstick (Z, Figure 2-10) from engine.
- Using a funnel, pour oil slowly through dipstick opening. Stop frequently, re-insert dipstick until it is seated completely, remove and check oil level. (Wipe dipstick clean each time before re-inserting.)
- Fill crankcase until oil level is at "FULL" mark on dipstick. DO NOT FILL ABOVE "FULL" MARK!
- Replace dipstick securely.

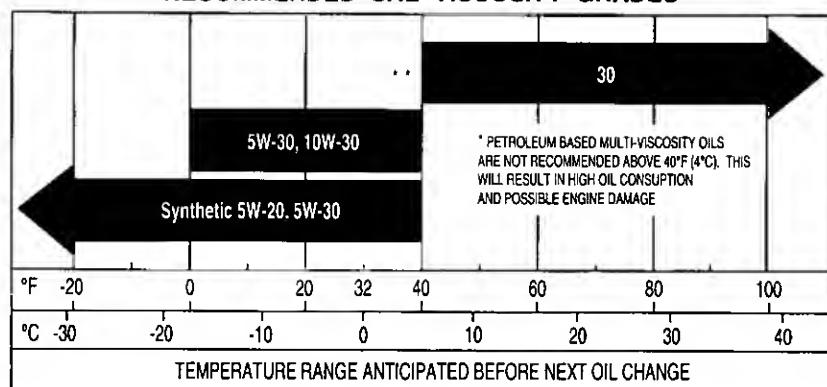
4 CYCLE OIL RECOMMENDATIONS:

CHANGE AND ADD OIL ACCORDING TO THE CHART BELOW.

We recommend the use of a high quality detergent oil classified "For Service SG, SF, SE, SD, SC." Detergent oils keep the engine cleaner and retard the formation of gum and varnish deposits. No special additives should be used with recommended oils.

NOTE: DO NOT MIX OIL WITH GASOLINE.

RECOMMENDED SAE VISCOSITY GRADES



- Air cooled engines run hotter than automotive engines. Use of petroleum based multi-viscosity oils (10W-30, etc) above 40° F (4°C), will result in high oil consumption and possible engine damage. Check oil level more frequently if using these types of oils.

- ** SAE 30 oil, if used below 40°F (4°C), will result in hard starting and possible engine bore damage due to inadequate lubrication.

Figure 2-11: Engine oil recommendations.

STEP 6: Check Tire Pressure

- Use a tire gauge to check the air pressure in the rear tires. The air pressure should be between 15-20 PSI (20 PSI maximum).
- Keep both tires equally inflated to help prevent machine from pulling to one side.

STEP 7: After Assembling and Before Using Unit

- Read this entire Owner's Guide for proper safety, operation and maintenance information.
- Make sure spark plug wire is connected to spark plug before starting unit.

3 Features and Controls

Read Me First!

Learn the location of the features and controls on your machine before starting the engine. For detailed step-by-step operating instructions, please refer to "Section 4: Operation."

⚠ WARNING

Before operating mower, be sure to read all safety, controls, and operating instructions in this Owner's Guide and on decals located on machine.

Operating Symbols

Various symbols are used on the mower to indicate control settings (your model may not have all of the symbols). These symbols are shown below with a description of their meaning.



FAST



SLOW



CHOKE



ENGINE STOP



ENGINE START



ENGINE RUN



ENGAGE



DISENGAGE

IMPORTANT: The mower is equipped with a blade-brake-clutch control system which is designed to stop the mower blades within three (3) seconds after release of the Operator Presence Control. This system will stop the blades but not the engine. Therefore, you can disengage the blade drive at anytime without having to stop and restart the engine. This feature is particularly useful when you need to cross gravel drives or rough terrain and you do not want the spinning blades to strike stones or hidden obstacles.



WARNING

The blade-brake-clutch control system should stop the mower blades within three (3) seconds after release of the Operator Presence Control. If the blades do not stop within three (3) seconds, put the Engine Throttle Control in the STOP position. Disconnect the spark plug wire and do not operate the mower until the blade-brake-clutch control system has been repaired.

LOCATION AND USE OF CONTROLS



Operator Presence Control

This lever (A, Figure 3-1) regulates the operation of the rear wheel brake and the separate Blade Drive Control.

To engage the Operator Presence Control, press and hold the lever against the handlebar grip. Engaging the lever releases the brake on the rear wheels (allows wheels to turn). The engaged position also permits the separate Blade Drive Control to lock in its engaged position (allows the mower blades to turn).

Releasing the lever (disengaged position) applies the rear wheel brake and quickly stops the wheels. Releasing the lever will also disengage the Blade Drive

Control, which will apply a brake that stops the blades within three (3) seconds.

Always disengage the Operator Presence Control before starting the engine. Always engage this control before engaging the separate blade drive or wheel drive controls.

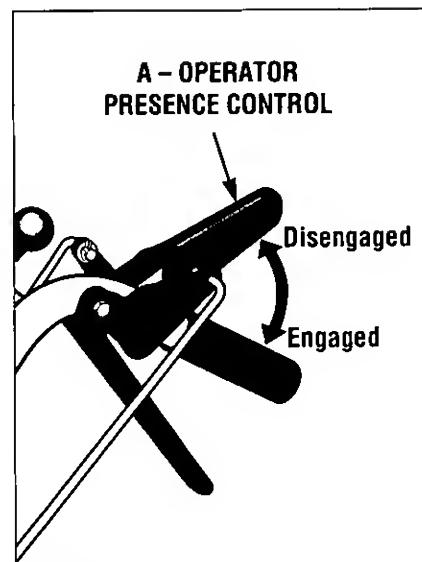


Figure 3-1

Blade Drive Control

Use this lever (B, Figure 3-2) to engage drive to the mower blades.

To engage the blades, first engage the Operator Presence Control (A, Figure 3-2). Then, push the spring-loaded Blade Drive Control lever (B) forward until it stays in the engaged position.

To stop the blades, release the Operator Presence Control (A). Doing so will disengage the Blade Drive Control (B) and automatically apply the brake that stops the blades.

When starting the engine, the Blade Drive Control should be disengaged (released). This helps to ensure that the blades will not start turning when the engine starts.

NOTE: Pushing the Blade Drive Control forward will engage the blades even though the Operator Presence Control is not engaged. However, this procedure is NOT RECOMMENDED as you must

maintain constant pressure on the lever (releasing lever disengages blades). Always engage the Operator Presence Control before engaging the Blade Drive Control.

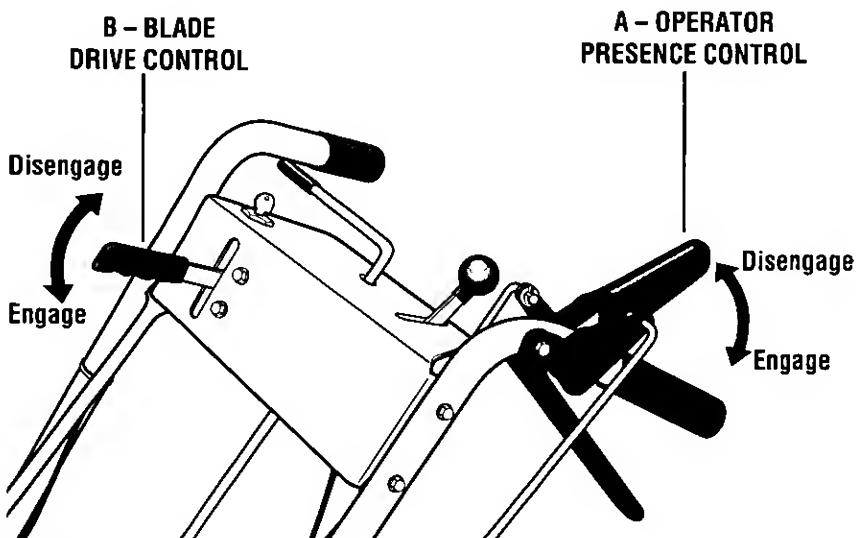


Figure 3-2

Gear Select Lever

This lever (C, Figure 3-3) is used to select any of four forward ground speeds (1 - Slow, 2 and 3 - Medium, 4 - Fast), N (Neutral) and R (Reverse). The gear shift pattern is shown in Figure 3-4.

To avoid damaging the transmission, do not shift gears when the mower is moving. Select forward ground speeds according to mowing conditions and terrain (use slower speeds in high grass or on rough terrain).

For forward travel, move the lever into one of the four numbered settings. To select reverse, shift to neutral and then pull up on the lever. Turn the lever to the R (reverse) position and release the lever.

Put the lever in N (neutral) to manually push the mower and when the mower is not in use.

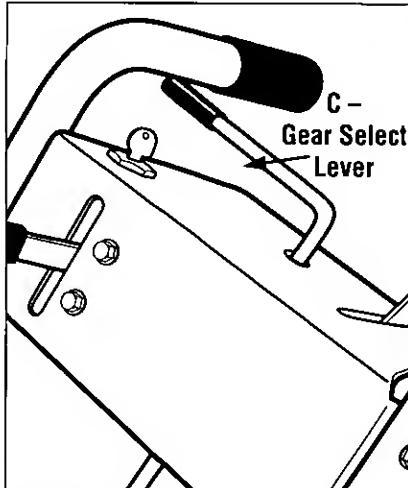


Figure 3-3



Figure 3-4: Shift pattern on console.

Features and Controls

Wheel Drive Control

Use this lever (D, Figure 3-5) to engage and disengage drive to the wheels.

To engage the wheels, first select a forward or reverse gear with the Gear Select Lever and press the Operator Presence Control (A, Figure 3-5) against the handlebar grip. Then, squeeze the Wheel Drive Control lever (D) up against the handlebar grip. The ground speed can be varied in any gear by increasing (to go faster) or decreasing (to go slower) pressure on the lever. **To avoid sudden acceleration, slowly squeeze the lever when first engaging the wheels.**

Release the Wheel Drive Control to disengage the wheels. The

wheels will gradually slow to a stop. NOTE: To stop the wheels quickly, release the Operator Presence Control along with the Wheel Drive Control.

When starting the engine, the Wheel Drive Control should be disengaged (released). This helps to ensure that the wheels will not start turning when the engine starts.



CAUTION

Do not engage the Wheel Drive Control without first engaging the Operator Presence Control. Doing so could result in wear or damage to the wheel brake mechanism.

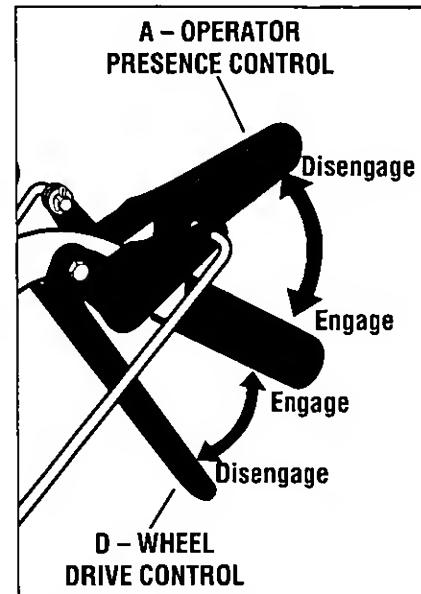


Figure 3-5

Cutting Height Control Lever

This lever (E, Figure 3-6) is used to adjust the mower cutting height. The cutting height can be adjusted from 1 to 4 inches.

Turn the lever clockwise to raise the cutting height; counterclockwise to lower the cutting height. A decal and pointer (not illustrated)

on the right side of the mower deck show the cutting height settings ranging from A (highest) to G (lowest). Note that the actual cutting heights will vary according to soil conditions.

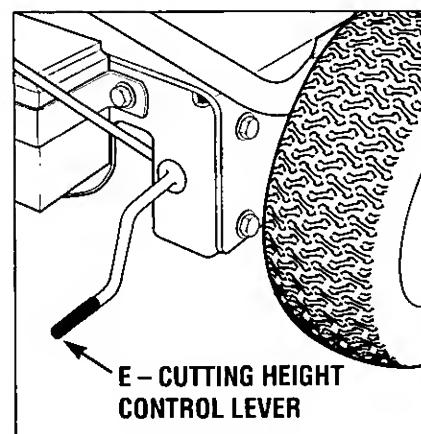


Figure 3-6

Mulcher Cover

To use the mulching feature, insert the mulcher cover (Figure 3-7) securely in the right side of the deck beneath the discharge chute.

Insert the front tab of the cover into the mower front support bracket (AA, Figure 3-7) and then close the cover, making sure that the slot (BB) in the cover is completely engaged in the rear edge of the deck opening.

Remove the mulcher cover if you want to do side-discharge mowing. The mulcher cover is pre-installed at the factory.

NOTE: The mulcher cover is designed to keep the discharge chute raised up while you mow. When the cover is removed, the discharge chute lowers.



DANGER

Before installing or removing mulching cover, stop engine, wait for parts to stop moving, and disconnect spark plug wire. Remove ignition key on electric start models.

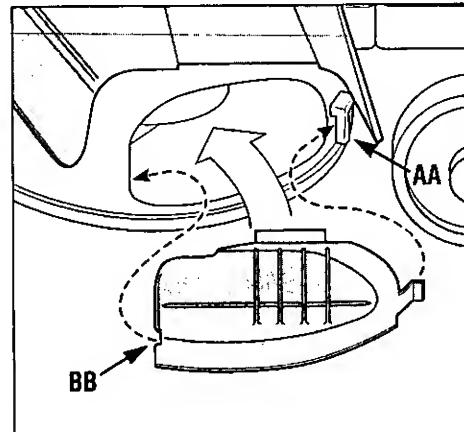


Figure 3-7

Engine Throttle Control

This lever (F, Figure 3-8) is used to adjust engine speeds and to stop the engine. Always run engine at fast speed setting for best mower performance. The throttle settings are shown to the right.

-  **CHOKE** - Use when starting a cold engine.
-  **FAST** - Use during mower operation.
-  **SLOW** - Use when idling engine.
-  **STOP** - Stops engine.

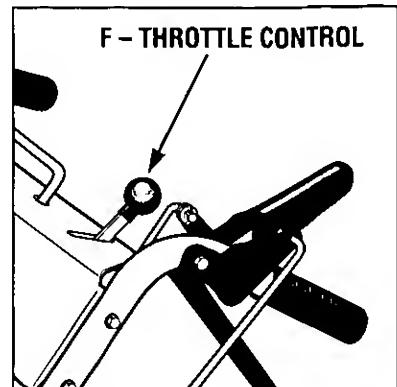


Figure 3-8

Ignition/Starter Switch - (Electric Start Model)

This three-position switch (G, Figure 3-9) is used to start and stop the engine on electric start models. The ignition key settings are shown to the right.

Do not turn the key until you have read the Operation Section in this Owner's Guide.

Always remove ignition key when leaving mower unattended or when inspecting, cleaning or servicing mower.

-  **STOP** - Stops engine.
-  **RUN** - After starting, key returns to run position.
-  **START** - Starts engine. Release key when engine starts.

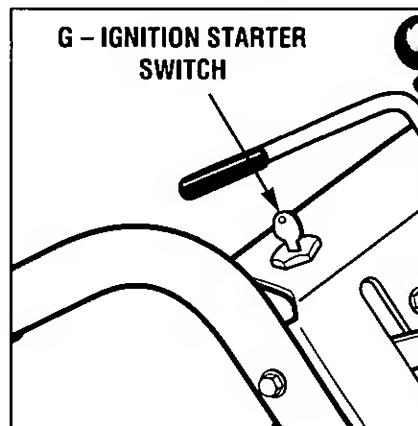


Figure 3-9

Engine Recoil Starter

The engine recoil starter (H, Figure 3-10) is used to "pull-start" the engine. Detailed instructions for using the engine recoil starter are found in the Operation Section of this Owner's Guide and in the Engine Owner's Manual. Do not pull the recoil starter until you have read the Operation Section.

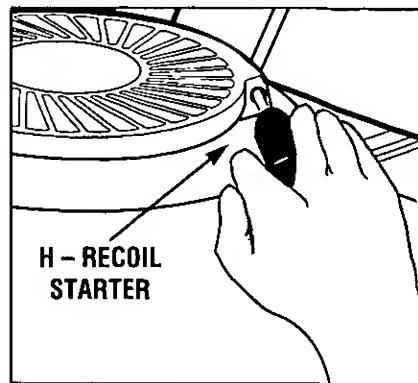


Figure 3-10

Operation

Read Me First!

As with any other piece of outdoor powered equipment, getting the "feel" for how your machine operates and getting to know the best techniques for particular jobs are very important to overall good performance.

Read this Section thoroughly before you start the engine. The instructions given here will help you become familiar with your machine and have you operating it efficiently in a short time.



WARNING

Before operating your machine, be sure you read and understand all safety, controls, and operating instructions in this Owner's Guide and on the decals on your machine.

Failure to follow these instructions can result in serious injury or property damage.

NOTE: All references to left, right, front and rear of the machine are determined by standing behind the handlebars and facing the direction of forward travel.

BEFORE OPERATING

Pre-Operation Checklist



Perform the following checks before each use of your machine:

- Review Section 1: "Safety" and Section 3: "Features and Controls."
- Check for loose or missing hardware. Tighten or replace before starting engine.
- Check the engine oil level. Refer to Section 5: "Maintenance" for instructions.
- Check the fuel level in the fuel tank (refer to next page for instructions).
- Check all levers for freedom of movement. Do not start engine if any lever does not function correctly.
- Adjust the blade cutting height (refer to this Section for instructions).
- Inspect the area to be mowed and remove any debris.
- Check that all guards and shields are in place and properly secured.
- Check the installation of the mulcher cover in the right side deck opening. Remove the mulcher cover if you want to side discharge the grass.
- On electric start models, check that all wiring connections are clean and tight.
- Check air pressure in rear tires at first use and every 25 operating hours. Maintain 15-20 PSI (maximum 20 PSI) in each tire. Keep tires inflated equally or mower may pull to one side.
- Attach the spark plug wire to the spark plug.

Fill Fuel Tank

Use clean, fresh, regular unleaded gasoline with a minimum octane rating of 77. Do not mix oil with gasoline. Purchase fuel in a quantity that will be used within 30 days. This will assure fuel freshness and volatility tailored to the season. Do not use gasoline which contains Methanol. Do not overfill fuel tank. Allow sufficient space for fuel expansion.

1. Stop engine and allow it to cool for three minutes before removing fuel fill cap. Do not check fuel level or add fuel while indoors.

2. Clean area around fuel fill cap and remove fill cap.

3. Using a funnel or spout, fill tank to 1/2 inch below bottom of fuel tank filler neck to prevent spills and to allow for fuel expansion.

4. Install fill cap securely and wipe up any spilled gasoline.

IMPORTANT: Do not mix oil with gasoline. Do not use Methanol. Refer to the separate Engine Owner's Manual for instructions and precautions regarding the use of gasoline containing alcohol (such as Gasohol).



DANGER

Gasoline is highly flammable and its vapors are explosive. Read and follow these precautions to help avoid severe personal injury or property damage.

- Do not remove gas cap or add gasoline if engine is running or still hot from operation. Allow engine to cool for at least three minutes before refueling.
- Keep an open flame, matches, sparks, or smoking materials away from fuel tank and fuel container.
- Do not fill fuel tank indoors. After filling, wipe up any spills and move machine away from gasoline fumes before starting engine. Securely replace the caps on the fuel tank and fuel container.
- Do not fill fuel tank completely. Fill tank to 1/2" below bottom of filler neck to provide space for fuel expansion.
- Store gasoline in an approved fuel container and in a well-ventilated area. Store it safely out of the reach of children.
- Do not store gasoline where vapors may reach an open spark or flame, or where ignition sources (such as hot water heaters, space heaters, furnaces, clothes dryers, stoves, electric motors, etc.) are present.

Adjust Mower Cutting Height

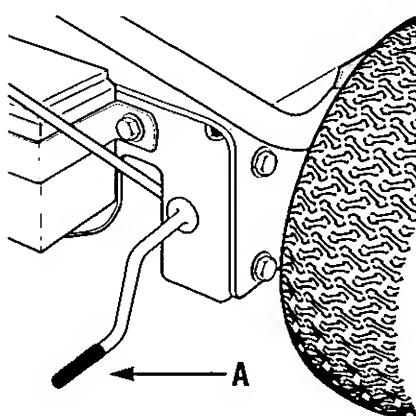
The cutting height can be adjusted from 1 to 4 inches by rotating the Cutting Height Control lever (A, Figure 4-1).

Choose cutting heights according to grass conditions and terrain. In heavy or tall grass, it is usually better to make the first cut at a higher setting and then make a second cut at the desired setting. When mowing in rough terrain, a higher setting is recommended as it will minimize the chances of the blade striking the ground or hidden obstructions.



CAUTION

To avoid personal injury, do not adjust cutting height while wheels or blades are turning. Release all handlebar controls and wait for all motion to stop before adjusting cutting height.



1. Release all mower controls before adjusting cutting height.

2. Turn Cutting Height Control lever clockwise to raise cutting height or counterclockwise to lower cutting height. A decal and pointer (not illustrated) on the right side of the mower deck show cutting height settings ranging from A (highest) to G (lowest). Note that actual cutting heights will vary according to the grass and soil conditions.

Figure 4-1: Cutting Height Control lever.

Operation

Test Blade-Brake-Clutch Control System

The mower is equipped with a blade-brake-clutch which is designed to stop the mower blades within three (3) seconds after release of the Operator Presence Control or the Blade Drive Control. Never tamper with or attempt to defeat the purpose of this safety device.

The control system is a mechanical device which is subject to wear. Therefore, test the operation of the blade-brake-clutch control system before each use of the mower. Refer to "Blade-Brake Control Test" at the end of this Section.

Select Mulching or Side-Discharge Mowing

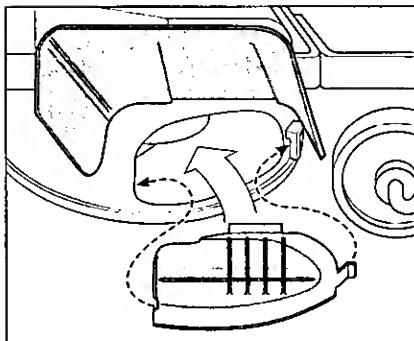


Figure 4-2: Mulcher cover

Your mower allows you to select either mulching or side-discharge of the grass clippings. To use the mulching feature, insert the mulcher cover to mulch the grass; or remove the cover if side discharge mowing is desired. Refer to "Mulching Cover" on page 16 for installation instructions.



DANGER

Before installing or removing mulching cover, stop engine, wait for parts to stop moving, and disconnect spark plug wire. Remove ignition key on electric start models.

MOVING THE MOWER WITHOUT ENGINE POWER

The mower can be manually pushed or pulled by putting the Gear Select Lever (C, Figure 4-3) in N (neutral) and pressing and holding the Operator Presence

Control (A, Figure 4-3) down against the handlebar grip.

To stop the wheels at anytime, release the Operator Presence Control.

STARTING AND STOPPING THE ENGINE



DANGER

Do not operate engine in an enclosed area. Engine exhaust contains carbon monoxide, a deadly gas that is odorless, colorless and tasteless. Always run engine outdoors and make sure there is adequate ventilation.

To Start the Engine

1. Move mower to a level area.
2. Release all controls on mower to prevent wheels or mower blades from rotating when engine starts.
3. Move Engine Throttle Control (E, Figure 4-3) fully upward to choke setting to start a cold engine or to fast (rabbit) setting to start a warm engine.



WARNING

To avoid injury:

- Keep hands and feet clear of mower blades or other rotating parts.
- Look behind you to be sure there are no obstacles before pulling recoil starter rope.

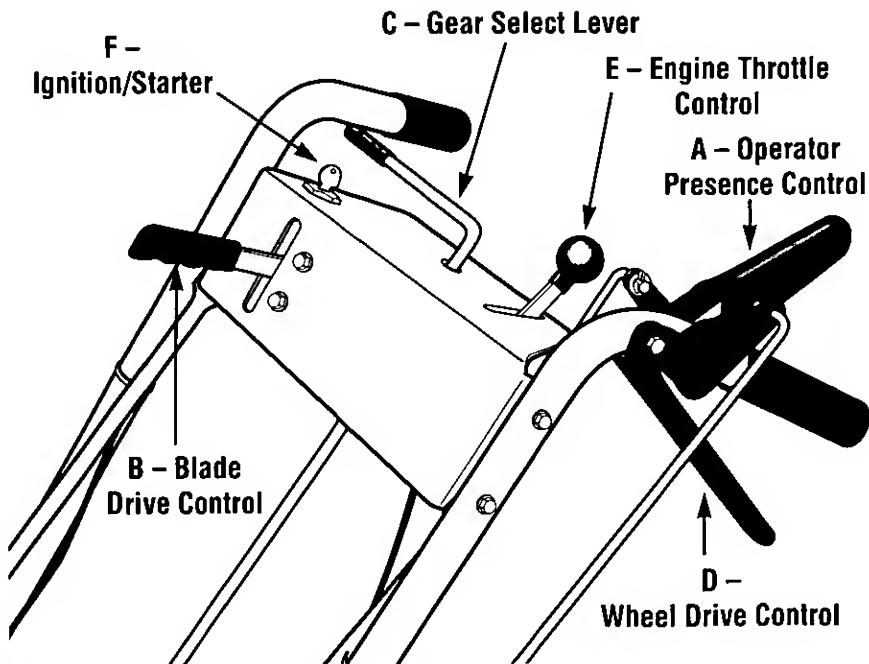


Figure 4-3: Mower Controls

4. To start engine using recoil starter:

A. Stand on left side (as viewed from behind handlebars) of machine. Be sure your feet are safely away from the underside of the mower deck and all mower controls are released. Place one foot on top of tire.

B. Grasp rope handle (G, Figure 4-4) and pull slowly until rope pulls slightly harder. Let rope rewind slowly. Then pull rope with a rapid, full arm stroke. Let rope return slowly. If engine fails to start after three pulls, repeat instructions starting with Step 2 (try setting throttle at fast setting).

C. When engine starts, operate in fast throttle setting (move throttle from choke setting to fast setting).

5. To start engine using electric starter:

A. Stand behind the handlebars and release all mower controls.

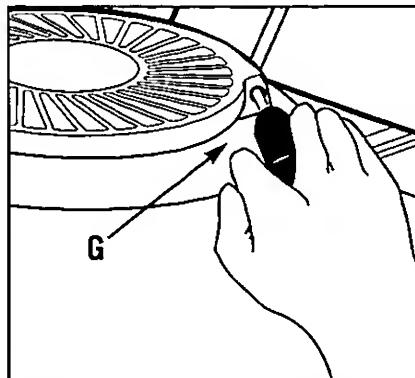


Figure 4-4: Engine recoil starter.

B. Turn ignition key (F, Figure 4-3) fully clockwise to crank engine. To avoid damage to starter motor, do not crank engine for longer than five seconds at a time. Also, allow 15 seconds between each start attempt. If engine fails to start after three attempts, repeat instructions starting with Step 2 (try moving throttle to fast setting).

C. When engine starts, release key and it will return to the run (middle) position.

D. Operate engine at fast throttle setting (move throttle from choke setting to fast setting).

NOTE: If the electric start system is not functioning, the engine can be started with the recoil starter.

To do so, first put the ignition key in the run (middle) position. Then follow Steps 1-4 above. Leave the key in the run position during engine operation.

To Stop the Engine

1. Release all mower controls to stop wheels or mower blade.
2. Move throttle control down to slow (turtle) position. (Whenever possible, gradually reduce engine speed before stopping engine.)
3. Move throttle control all the way down to stop position or turn ignition key (electric start models) fully counterclockwise to stop position.
4. On electric start models, remove ignition key before leaving mower unattended.

ENGAGING THE BLADES



DANGER

To avoid injury from rotating blades, keep face, hands and feet clear of mower blades at all times.

To Engage the Blades

1. Start engine as described in "To Start the Engine" instructions. Put engine throttle in fast speed setting.
2. Press and hold Operator Presence Control (A, Figure 4-3) against handlebar grip.

3. Slowly push Blade Drive Control (B, Figure 4-3) fully forward until it stays in the engaged position. The blades are now rotating.

To Stop the Blades

To stop the blades, release the Operator Presence Control.

Operation

TO ENGAGE THE WHEELS

! CAUTION

- To avoid damaging the transmission, do not shift gears while in motion.
- To avoid damaging the wheel brake mechanism, do not engage the Wheel Drive Control without first engaging the Operator Presence Control.

1. Start engine as described in "To Start the Engine" instructions.

2. FOR FORWARD TRAVEL:

A. Press and hold Operator Presence Control (A, Figure 4-3) against handlebar grip.

B. Put the Gear Select Lever (C, Figure 4-3) into one of the numbered settings (1 - Slow, 2 and 3 - Medium, 4 - Fast). When first practicing with the mower, put lever in No. 1 setting. Select forward speeds according to mowing conditions and terrain. Use slower speeds on rough terrain or when grass is heavy or thick. The forward speed can be increased on smooth terrain or if the grass cover is light. Allow the wheels to stop completely before shifting from one forward speed into another.



WARNING

Before engaging the Wheel Drive Lever for the very first time, check that the neutral (N) position on the Gear Select Lever is properly adjusted. See "Neutral Adjustment" in Section 5: Maintenance for the proper procedure to follow.

Failure to follow this instruction could result in personal injury or property damage.

C. To start the wheels, slowly squeeze the Wheel Drive Control (D, Figure 4-3). The harder you squeeze, the faster the wheels will turn. To avoid sudden acceleration, slowly squeeze the lever.

D. TO STOP THE WHEELS:

- To stop drive power to the wheels, release the Wheel Drive Control. The wheels will gradually slow to a stop.
- To quickly stop the wheels, release **both** the Wheel Drive Control and the Operator Presence Control.

E. TO STOP THE WHEELS:

- To stop drive power to the wheels, release the Wheel Drive Control. The wheels will gradually slow to a stop.
- To quickly stop the wheels, release **both** the Wheel Drive Control and the Operator Presence Control.
- Return the Gear Select Lever to the N (neutral) position when you have completed reverse operation. Allow the wheels to stop completely before shifting from R (reverse) into a forward speed.



WARNING

To avoid injury or property damage:

- Look behind mower before and during reverse operation.
- Stop the mower blades before operating in reverse.

3. FOR REVERSE TRAVEL:

A. Stop the mower blades and wheels by releasing the Operator Presence Control (A, Figure 4-3).

B. Press and hold Operator Presence Control against handlebar grip.

C. Put the Gear Select Lever (C, Figure 4-3) in R (reverse) setting by first moving lever to N (neutral). Then pull lever up, turn it to R position, and release lever.

D. To start the wheels, slowly squeeze Wheel Drive Control (D, Figure 4-3). To avoid sudden acceleration, slowly squeeze the lever.

MAKING TURNS



The mower turns easily by pushing the handlebars in the opposite direction that you want to turn. The differential mechanism inside the transaxle will allow the inside turning wheel to stop or slow down while the outside turning wheel is powered by the drive system.

Reduce the wheel speed before turning the mower. For tight turns, disengage the Wheel Drive Control and manually push the mower through the turn (if needed, put the Gear Select Lever in neutral so the wheels turn freely).

MOWING TIPS AND HINTS



WARNING

To avoid injury or property damage:

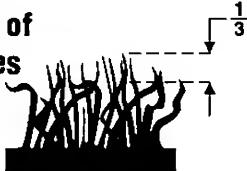
- Before mowing, thoroughly inspect area where mower is to be used and remove all stones, sticks, wires, bones, nails and other foreign objects.
- Disengage mower blades before crossing gravel drives, roads, or sidewalks to prevent blades from throwing stones or other hazardous objects.



Mow When Lawn Is Dry

For best results, avoid cutting grass when it is wet. Wet grass tends to form clumps which interfere with the cutting action. The best time to mow is in the late afternoon or early evening when the grass is usually dry.

Cut Top 1/3 of Grass Blades



Cutting more than 1/3 of grass length may cause the grass to become excessively dry. In tall grass, it may be necessary to mow at a higher setting and then mow again at the desired height.

NOTE: The cutting height is critical to achieving a well-groomed lawn. You should experiment with various settings to find that "just right" cutting height.

Vary Cutting Pattern



Vary the cutting pattern from week to week to help prevent matting of the grass. One week, mow from north to south, the next week mow from east to west. Overlap several inches when mowing to obtain an even appearance.

Mowing on Slopes



Do not mow excessively steep slopes (see WARNING statement below). Slow down and exercise extreme caution when changing direction on slopes. Before mowing on slopes, check the engine oil level and make sure that the level is at the FULL mark. Maintaining a FULL oil level is particularly important when operating on slopes as oil can be drained away from vital engine parts.



WARNING

To avoid injury or property damage:

- Maximum safe operating angle is 15°.
- Exceeding maximum safe operating angle may cause tipping or loss of footing.
- Do not mow wet slopes.
- Mow across slopes, not up and down.
- Exercise extreme caution when changing direction on slopes.

Mulching Leaves

- The mower can also be used to mow leaves in the fall. The leaf particles filter down into the lawn and provide added fertilizer.
- The leaves must be dry in order to be mulched.
- Use a slower ground speed if the leaves are not mulched into fine particles.
- If you mulch oak leaves (which add acid to the soil), add lime to the lawn in the spring to reduce the acidity of the soil.

Keep Mower Blades Sharp

For best mower performance, keep the blades sharp. A dull blade will tear, bruise and split the ends of grass. See blade sharpening instructions in Section 5: Maintenance.

Clean Mower Frequently

Clean the underside of the mower deck frequently to remove grass build-up. See mower cleaning instructions in Section 5: Maintenance.

Precision Trimming

For precision trimming, use the slowest gear and inch the mower along by "feathering" the Wheel Drive Control lever. Or, disengage the wheel drive by releasing the Wheel Drive Control so that you can manually maneuver the mower (if needed, put the Gear Select Lever in neutral so that the wheels turn freely).

Mowing Ditches

If you have to mow ditches, stop the engine and adjust the cutting height to its highest setting. Mow in the direction of the ditch. Mow both sides of the ditch first, and then mow the bottom. When mowing ditches, watch out for cans, bottles, or other debris.

Operation

BLADE BRAKE CONTROL TEST

When the Operator Presence Control is released during operation of the mower, the engine does not stop, but the blades should stop within three (3) seconds. The following test provides a visual test of whether the Blade Brake Control System is functioning. Perform this test before each use of the mower.



WARNING

To avoid personal injury or property damage, make sure that the mower is on grass, and that the test area is clear of foreign objects and bystanders before you begin the Blade Brake Control Test.

If the Operator Presence Control or the Blade Drive Control are not adjusted correctly, the blades may continue to rotate after release of the Operator Presence Control. If the blades do not stop within three (3) seconds of release of the Operator Presence Control, move the Engine Throttle Control to the STOP position, disconnect the spark plug wire, and move the wire away from the spark plug. Do not operate the mower until the Blade Brake Control System has been repaired.

Failure to do this could result in personal injury or property damage.

1. Park mower on a portion of lawn which has not been recently mowed.
2. Set the cutting height so the mower cuts 1/3 of the grass height.
3. Start the engine.
4. Press the Operator Presence Control down against the handlebar grip and push the Blade Drive Control fully forward until it stays in the engaged position.
5. Put the Gear Select Lever in the No. 1 setting.
6. Engage the wheels with the Wheel Drive Control and drive the mower for several feet. Then release the Operator Presence Control.
 - A. Look at the lawn just mowed. The lawn should be cut up to the point where the Operator Presence Control was released.
 - B. Press the Operator Presence Control against the handlebar grip but DO NOT re-engage the Blade Drive Control. Drive the mower forward for several more feet. Release the Operator Presence Control and look at the lawn. The grass should NOT have been cut. This indicates that the Operator Presence Control has disengaged the blade drive and stopped the blades.
7. If the mower cuts the grass in Step 6-B, the Operator Presence Control is NOT disengaging the blade drive. *Immediately stop the engine, disconnect the spark plug wire, and move the wire away from the spark plug.*
8. Do not use the mower until the Blade Brake Control System has been inspected, adjusted or repaired by an authorized dealer.



Carefully read this Section on mower and engine maintenance and service.

Performing the required maintenance according to schedule will ensure the proper performance and long life of your machine.



WARNING

Before inspecting, cleaning or servicing the machine, shut off engine, disconnect spark plug wire, and make sure that all moving parts have come to a complete stop.

Failure to follow these instructions can result in personal injury or property damage.

NOTE: All references to left, right, front and rear of the machine are determined by standing behind the handlebars and facing the direction of forward travel.

Read Me First!

IMPORTANT:

Refer to Maintenance Chart in this Section for a listing of regularly scheduled maintenance procedures.

ENGINE SERVICE

Routine engine service is described below. For more complete engine service information, refer to the engine manual provided with your machine. For complete engine service, contact your authorized dealer.

ENGINE OIL



OIL LEVEL: Engine oil level must be between "ADD" and "FULL" marks on dipstick at all times. Check before each use and every 5 operating hours.

OIL CHANGE: On a new engine, change oil after first 2 hours of use, then change oil regularly as specified on the Maintenance Chart. Refer to Engine Owner's Manual for oil capacity.

OIL TYPE: Use clean, high quality detergent oil having an A.P.I. service classification of SF, SG, or SH. Use no special additives with oil. Do not mix oil with gasoline.

OIL VISCOSITY: Change oil according to following temperature ranges.

Above 40°F: Use SAE 30W. Use of petroleum based multi-viscosity oils is not recommended above 40°F. This will result in high oil consumption and possible engine damage.

Between 0°F and 40°F: Use SAE 5W-30 or 10W-30. Using 30W oil below 40°F will result in hard starting and possible engine damage. NOTE: Refer to Engine Owner's Manual for information regarding synthetic oils.

Checking Oil Level

1. Park machine on level ground.
2. *Stop engine, wait for parts to stop moving, and disconnect spark plug wire.*
3. Clean area around dipstick (Z, Figure 5-1) to prevent dirt from entering oil fill hole.
4. Remove dipstick. Oil level must be between "ADD" and "FULL" marks. Do not exceed "FULL" mark on dipstick.
5. To add oil, pour slowly into dipstick opening. While adding, check oil level frequently by securely replacing dipstick and removing to read oil level. Wipe dipstick clean each time oil level is checked.
6. After filling to "FULL" mark, securely replace dipstick.

Maintenance

Changing Oil

Change oil while engine is still warm from recent operation. Warm oil flows more freely and carries away more impurities.

1. *Stop engine, wait for parts to stop moving, and disconnect spark plug wire.*
2. Remove dipstick (Z, Figure 5-1).
3. Remove protective cap (A, Figure 5-2) to expose oil drain port (B).
4. Push oil drain hose (D) (included in hardware bag with unit) onto oil drain port. Route other end of hose to an appropriate oil collection receptacle.
5. Twist oil drain fixture (C) to the open position. Pull out. Drain oil completely.
6. Push in and twist oil drain fixture to the closed position. Remove drain hose. Replace protective cap (A).
7. Refill engine with fresh oil and securely replace dipstick.

NOTE: Please dispose of all waste materials in an ecologically responsible manner. Use proper waste material storage containers

ENGINE CLEANING

- *Stop engine, wait for parts to stop moving, disconnect spark plug wire, and allow engine to cool before inspecting or cleaning engine.*
- Daily or more often, before running engine, remove grass and chaff from recoil finger guard or rotating screen to prevent engine damage caused by overheating. Also keep cooling vanes, governor linkage, springs and controls free of debris.
- Daily or more often, before running engine, clean muffler area (be sure muffler is cool) to remove all grass and combustible debris. If engine is equipped with a spark arrestor screen, remove assembly every 50 hours for

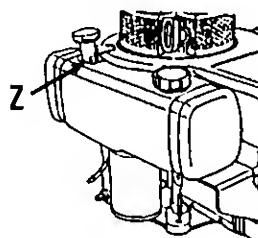


Figure 5-1: Engine oil fill tube and dipstick.

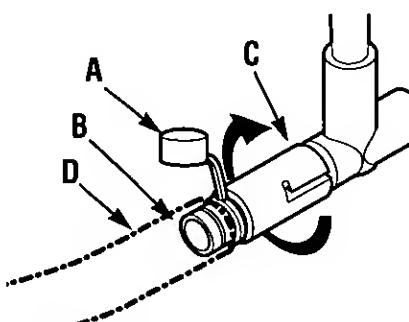


Figure 5-2: Engine oil drain port.

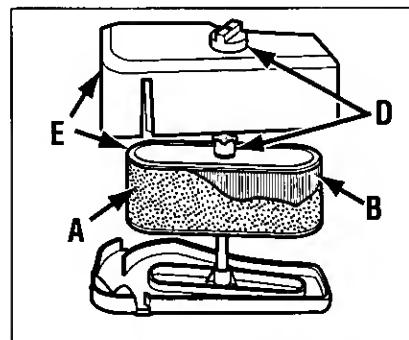


Figure 5-3: Engine air cleaner assembly.

cleaning and inspection. Replace if damaged.

- Grass or chaff may clog engine's air cooling system, especially after prolonged operation cutting tall, dry grass. See engine owner's manual for instructions on cleaning underneath the engine blower housing.

AIR CLEANER SERVICE

Improper air cleaner maintenance can cause engine damage. Refer to the engine owner's manual for more complete air cleaner service information.

SERVICE SCHEDULE:
Outer foam pre-cleaner - wash and re-oil every 25 operating hours or every season, whichever occurs first.

Inner paper cartridge - clean or replace every 100 operating hours or every season, whichever occurs first.

To Service Air Cleaner (Figure 5-3)

1. *Stop engine, wait for parts to stop moving, and disconnect spark plug wire.*
2. Unscrew mounting screws and/or remove knobs (D). Remove covers (E). Remove paper cartridge (B) and foam pre-cleaner (A). Separate foam pre-cleaner from paper cartridge.
3. Wash foam pre-cleaner (A) in liquid detergent and warm water. Squeeze dry in a clean cloth.
4. Saturate foam pre-cleaner in clean engine oil. Wrap in clean, absorbent cloth and squeeze to remove all excess oil.
5. Replace paper cartridge (B) if necessary.
6. Reassemble air cleaner components. Tighten knobs/screws (D) securely. Secure cover assembly (E) on air cleaner body.

SPARK PLUG

Inspect the spark plug (Figure 5-4) after every 100 hours of operation. Be sure the gap is set at .030". Do not reuse plug if it is severely worn or damaged.

Best results are obtained with a new plug. See engine owner's manual to determine proper replacement plug. Use of incorrect plug can cause engine damage.

NOTE: Do not clean spark plug in machines which use abrasive grit. Clean spark plug by scraping or wire brushing, or washing with a commercial solvent.

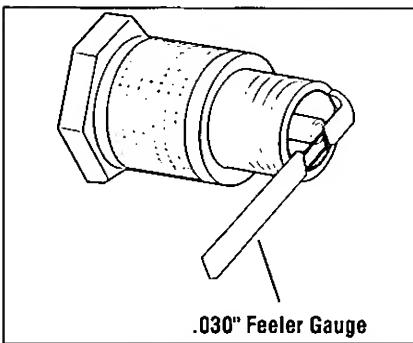


Figure 5-4: Spark plug.

BATTERY (if applicable)

Charge battery if unit is to be stored for longer than three weeks. During the mowing season, battery is kept charged by charging system on engine.

To Charge Battery

1. Plug charger connector into wire harness connector located below ignition switch in handlebar console.
2. Plug charger into 120V wall outlet. (Note that battery charger is designed for use indoors and should not be exposed to rain or snow.)
3. Charge battery for 24-48 hours if unit is to be stored for longer than three weeks.



WARNING

Charge battery only with charger supplied with machine. Do not short circuit battery wires. Remove any jewelry before working on or near the battery or electric start system. Failure to follow these instructions could result in personal injury or property damage.

4. After charging, unplug charger from outlet, then unplug charger from connector on wire harness located below handlebar console.

from falling). Tipping the mower forward or to either side could result in damage to engine.



WARNING

Before servicing underside of mower, stop engine, wait for all parts to stop moving, and disconnect spark plug wire. Remove ignition key from keyswitch on electric start models. Failure to follow this instruction could result in personal injury or property damage.

MOWER SERVICE

The following maintenance/repair procedures can be performed by either the owner or a local White Outdoor dealer.

TIPPING MOWER FOR SERVICE

When servicing the underside of the mower for any reason, the mower should only be tipped backward on its rear wheels (and securely propped up to prevent it

CARBURETOR

The carburetor is adjusted at the factory. It should not need to be reset. If black exhaust is noted, check the air cleaner first. An over-rich mixture is usually caused by a poorly serviced or clogged air cleaner element, not an improperly adjusted carburetor. If readjustment is necessary, refer to engine owner's manual or contact your local White Outdoor dealer.

ENGINE STORAGE

If engine will not be used for 30 days or more, prepare it for storage by following the recommended procedures found in the engine owner's manual.

TIP: Before tipping mower, install a small plastic sandwich-style bag under the gas cap and tighten securely. This will virtually eliminate any fuel weepage from the cap. *Be sure to remove the plastic bag before re-using mower.*

Maintenance

BELT COVER REMOVAL

The belt cover must be removed to perform several maintenance procedures.

To Remove Belt Cover

1. *Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.*
2. Remove four screws (R, Figure 5-5) and remove cover.

To Reinstall Belt Cover

1. Position belt cover in place.
2. Secure with four screws removed earlier.



WARNING

Do not operate unit without belt cover installed. Failure to follow this instruction could result in personal injury or property damage.

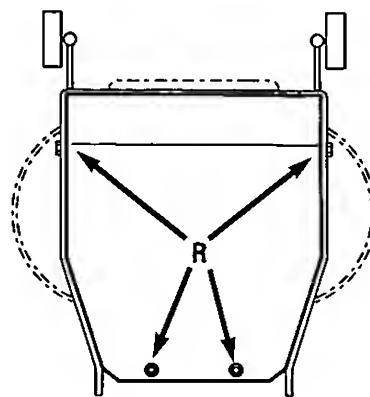


Figure 5-5: Belt cover removal.

BLADE SPINDLE BELT RE-PLACEMENT

Follow this procedure to remove and replace the blade spindle drive belt (remove blade drive belt first; see "Blade Drive Belt Replacement" below).

1. *Stop engine, wait for all parts to stop moving and disconnect spark plug wire.*
2. Remove belt cover (see "Belt Cover Removal").
3. Align sight holes (O, Figure 5-6) in pulley with spindle housing-to-mower deck mounting bolts (L).
4. Loosen screw (J) and rotate arm (K) to the rear.
5. Loosen four mounting bolts (L) securing spindle housing (beneath mower deck) to mower deck.
6. Slide spindle housing (with pulley attached) toward center.

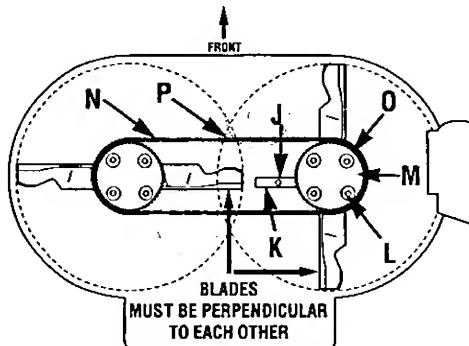


Figure 5-6: Blade Spindle Belt.

7. Replace belt (N) with new belt. **IMPORTANT:** Set blades perpendicular (90°) to each other.

8. Rotate arm (K) to move spindle housing and apply tension to belt. Belt cogs and pulley grooves must mesh together. When applying moderate finger tension (8-12 lbs.), belt should deflect approximately 1/2" (12.7 mm) at (P), midpoint of deck.
9. Tighten bolts (L) to 15 ft.-lbs. (20.3 Nm). Tighten screw (J).
10. Blades must not contact deck. Check and readjust as needed.
11. Reinstall blade drive belt and belt cover (removed earlier).

BLADE DRIVE BELT REPLACEMENT

Follow this procedure to remove and replace the blade drive belt. An assistant will be needed.

To Remove Belt

1. *Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.*
2. Disengage blade drive control (Figure 5-7) by releasing all controls on the mower.
3. Remove belt cover (see "Belt Cover Removal").
4. Loosen belt guides (B and C, Figure 5-8).
5. Move flap bracket (N, Figure 5-8) out of the way by loosening two screws (M).
6. Remove belt (A, Figure 5-8) from around sheaves.

To Install Belt

1. Route belt (A, Figure 5-8) around sheaves as shown.
2. Have an assistant hold down Operator Presence Control and then push the Blade Drive Control forward until it latches in place (Figure 5-7).
3. With the Blade Drive Control lever engaged, adjust and tighten belt guide (B) to 1/32 - 1/16" away from tensioned belt. (Be sure that belt does not contact belt guide when belt is under tension.) Secure belt guide (C) rotated into position as shown in Figure 5-8.

4. Disengage Blade Drive Control.
5. Re-tighten two screws (M, Figure 5-8) that secure flap bracket (N).
6. Reinstall belt cover securely.

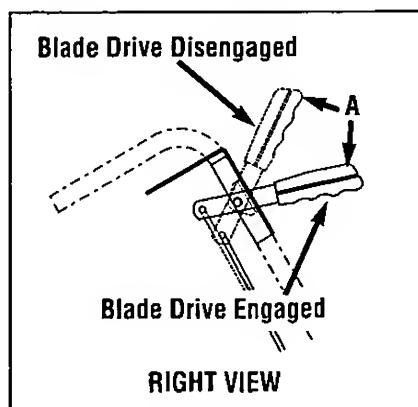


Figure 5-7: Blade Drive Control.

BLADE BRAKE REPLACEMENT

Follow this procedure to install a new blade brake.

To Remove Blade Brake

1. *Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.*
2. Remove belt cover as described in "Belt Cover Removal" instructions.
3. Remove hardware (G, Figure 5-8) securing blade brake (H).
4. Remove old brake (H) from idler arm (I).

To Install Brake

1. Position new brake (H) in place on idler arm (I).
2. Center brake in sheave groove and secure brake (H) with hardware (G) removed earlier.
3. Reinstall belt cover securely.
4. Test operation of blade brake (see "Blade Brake Control Test" in Operation section).

BLADE DRIVE BELT ADJUSTMENT

If the blade drive belt is slipping due to lack of belt tension, follow the steps below.

1. *Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.*
2. Remove belt cover as described in "Belt Cover Removal" instructions.
3. With mower on level ground, adjust blade cutting height at about 3" (measure from ground to flat portion of blade).
4. With the Blade Drive Control (Figure 5-7) in the disengaged position, set a gap of 1/8" between the spring (F, Figure 5-9) and flat washer (E) by adjusting the nut (D).

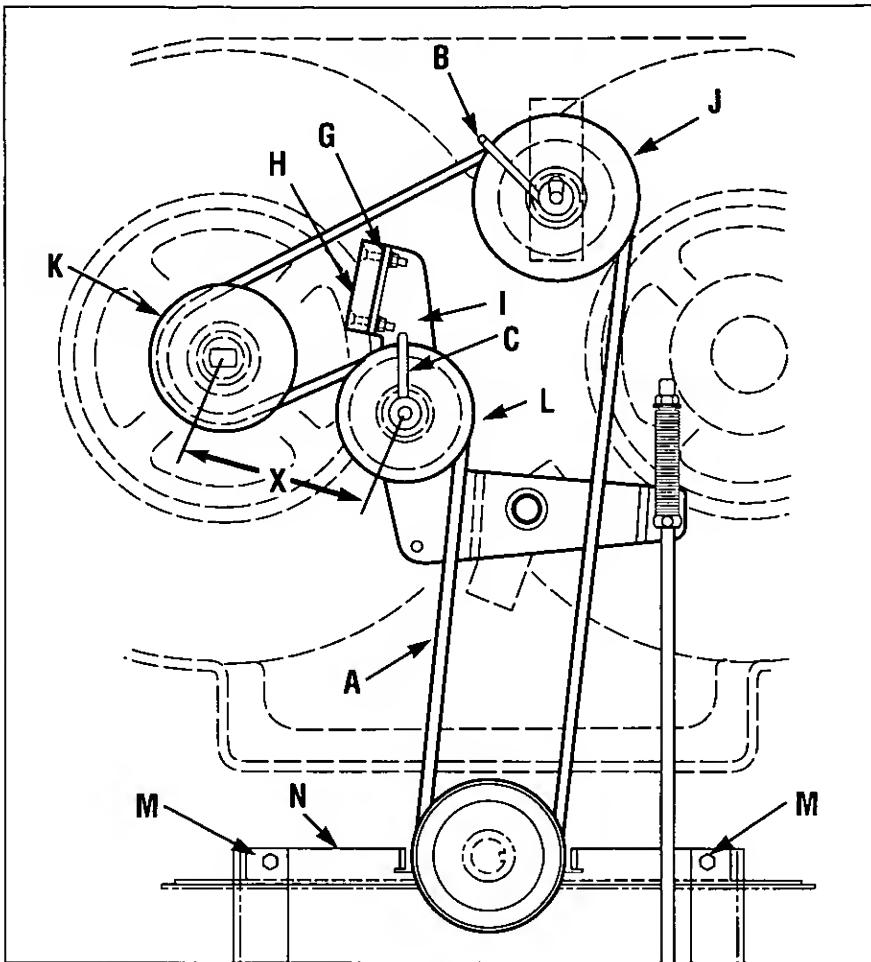


Figure 5-8: Blade drive.

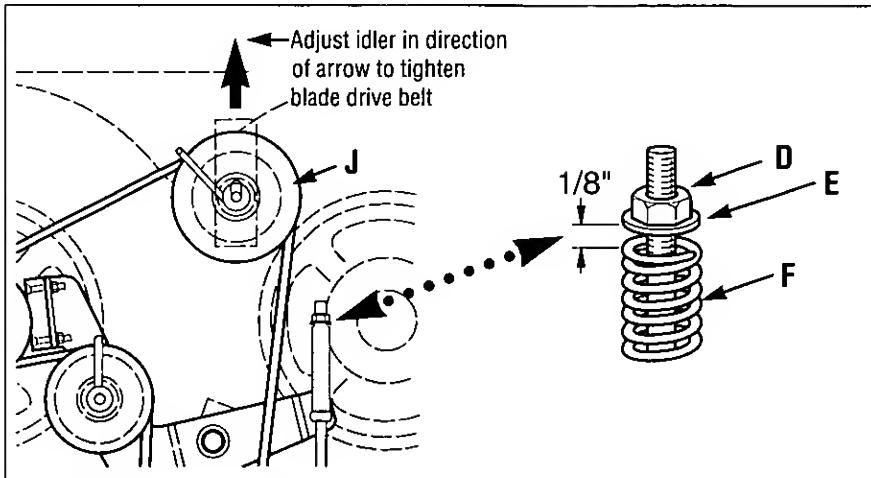


Figure 5-9: Blade drive adjustment.

Maintenance

5. Reinstall the belt cover securely.
6. Test the operation of the blade brake (see "Blade Brake Control Test" in the Operation section).
7. If the drive belt slips during operation, it may be necessary to relocate idler (J, Figure 5-9) in the slot provided in the mounting bracket. **With the engine stopped and the spark plug wire disconnected**, loosen the hardware on the idler (J) and slide it forward to take up slack in the belt.
8. Engage the blade drive and measure the distance (X, Figure 5-8) between the centers of pulleys (K) and (L). The distance should be 5-1/2 to 5-5/8". After obtaining the correct dimension, reinstall the belt cover securely and test the operation of the blade brake.

BLADE DRIVE CONTROL LEVER ADJUSTMENT

Make the following adjustment if the Blade Drive Control Lever releases during operation.

1. **Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.**
2. Engage the Operator Presence Control and the Blade Drive Control. Without releasing the controls, look inside the cutout at the rear of the frame and make sure the Operator Presence Control latches (A and B, Fig. 5-10) are fully engaged at point (C). If they are not fully engaged, improper operation or premature wear could result. To adjust, loosen hex nut (D) and shorten length of control rod (E). To avoid over-adjusting, turn rod only 1 to 2 turns per adjustment.
3. Tighten hex nut securely after adjusting control rod.
4. Test by releasing the Operator Presence Control. If properly adjusted, the Blade Drive Control will disengage when the Operator Presence Control is released. Re-adjust as necessary by repeating Steps 2 and 3.

WHEEL DRIVE BELT REPLACEMENT

Follow this procedure to replace the wheel drive belt.

1. **Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.**
2. Release all mower controls.
3. Remove belt cover as described in "Belt Cover Removal" instructions.
4. Locate wheel drive belt (O, Figure 5-11) and remove it from top sheave of engine sheave, back-sided idlers (P and Q) and transmission sheave (R).

5. Install new belt shown in Figure 5-11. Belt must be installed "inside out" "V" side of belt lies against engine sheave only. Flat side of belt lies against transmission sheave (R) and back-sided idlers (P and Q).
6. Make sure belt is inside belt guide (S, Figure 5-11).
7. Reinstall belt cover securely.
8. An adjustment to the drive belt may be necessary. See "Wheel Drive Belt Adjustment" on the next page.

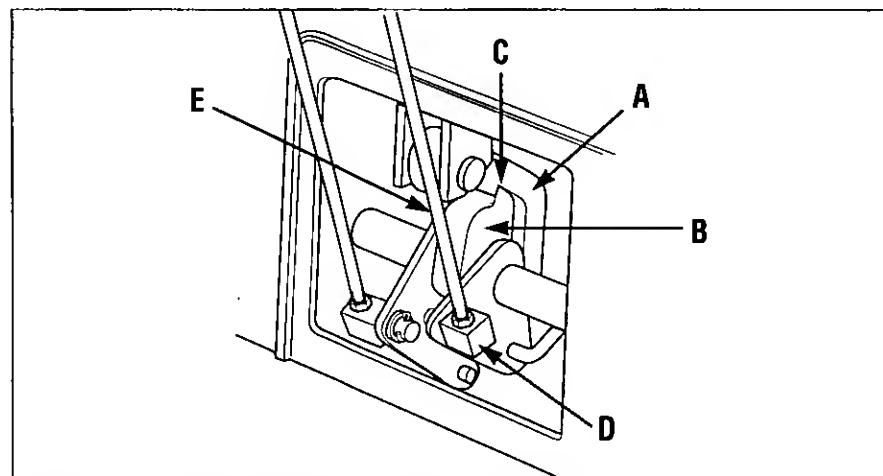


Figure 5-10: Blade Drive Control Lever adjustment.

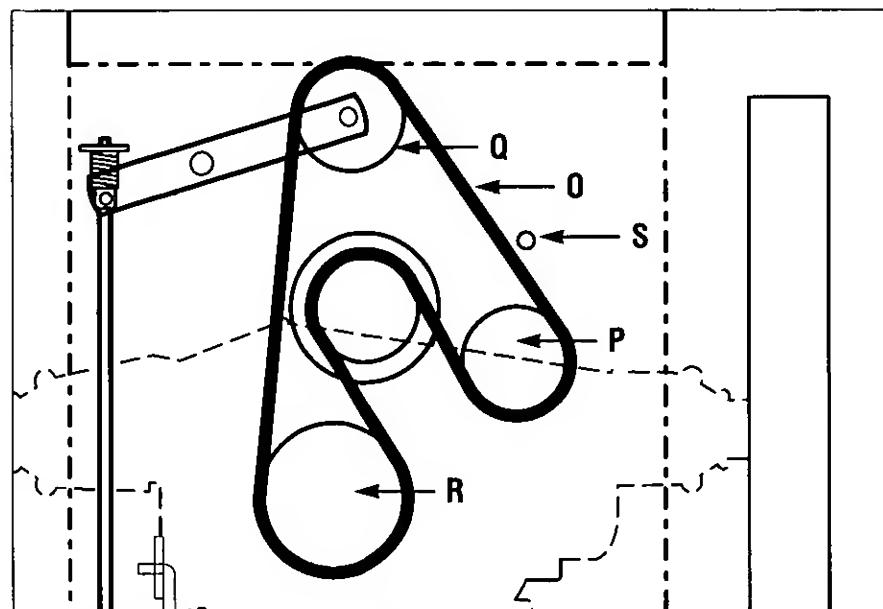


Figure 5-11: Wheel drive belt replacement.

WHEEL DRIVE BELT ADJUSTMENT

The wheel drive belt requires an adjustment if loss of drive belt tension (slippage) occurs. This is most noticeable when more traction is required (such as going up slopes).

To Test Wheel Traction

1. Park machine on a paved (concrete, etc.) surface with front edge up against a sturdy wall, fence, etc.
2. Put Gear Select Lever in No. 1 setting.

IMPORTANT: Do not park against a painted or sided wall. Testing the wheel drive system requires machine to be forcibly pushed against wall. Damage to paint or siding could result.

3. With engine running, and machine placed firmly up against wall, hold down Operator Presence Control and fully engage wheel drive by squeezing Wheel Drive Control until it contacts handlebar.
4. Wheels should slip on paved surface. If they do not, an adjustment is required.

To Adjust Wheel Drive Belt

1. *Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.*
2. Remove cotter pin (A, Figure 5-12A) from upper end of Wheel Drive Control rod. Slide rod out of lever assembly.

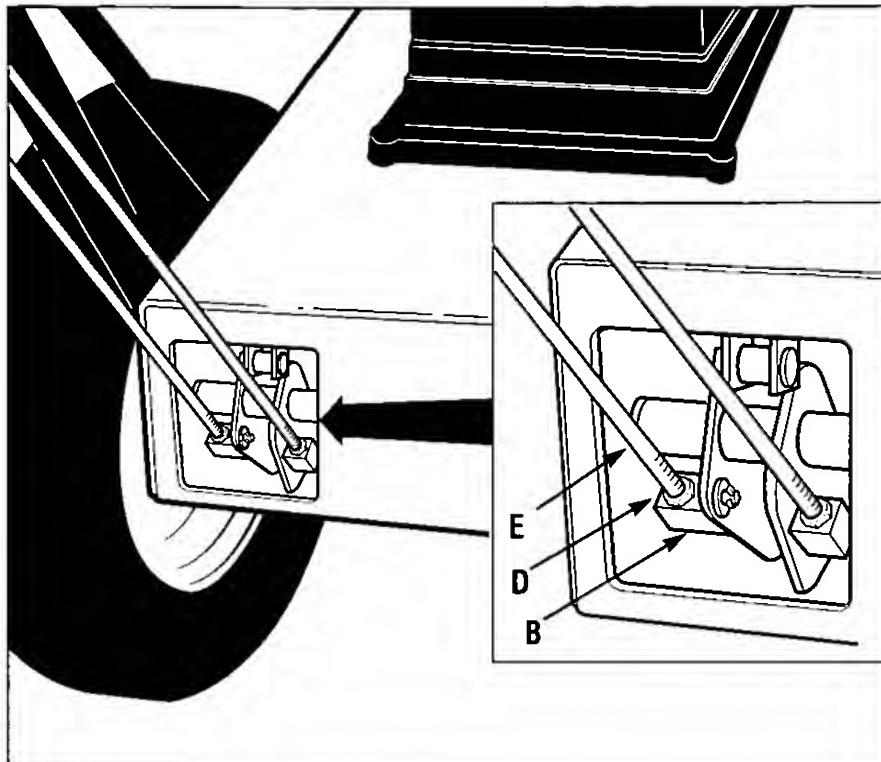


Figure 5-12: Wheel drive belt adjustment.

3. Loosen jam nut (D, Figure 5-12).
4. Thread rod (E, Figure 5-12) one or two turns clockwise for more tension or counterclockwise for less tension.
5. Insert rod back into hole in Wheel Drive Control lever and install cotter pin. Bend ends of cotter pin to secure.
6. Retest wheel traction. Repeat adjustment procedure if necessary. Most comfortable operation will be obtained when the adjustment allows the lever to just make contact with the handgrip as sufficient belt traction is achieved. When adjustment is complete, tighten jam nut (D) firmly against block (B).

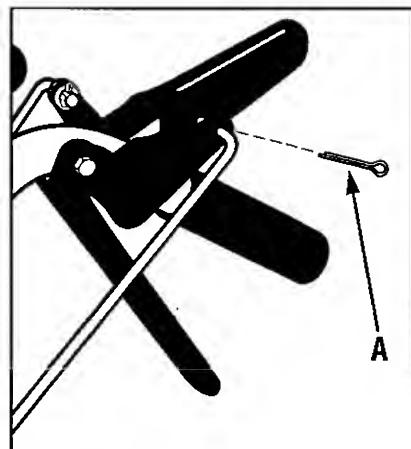


Figure 5-12A

Maintenance

WHEEL BRAKE ADJUSTMENT

This adjustment may be required if the machine does not hold on a hill with the Operator Presence Control disengaged, or if the brake drags with the Operator Presence Control engaged and the transmission in neutral.

1. Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.

2. Disengage (release) the Operator Presence Control (M, Figure 5-13).

3. Slowly adjust at nut (O), if necessary, until the distance between the back of brake arm (N) and bracket (P) is $3/8"$ - $5/16"$. Use small adjustments (1/4 turn maximum). NOTE: It may be necessary to relieve spring tension when decreasing distance. To do so, have an assistant engage the Operator Presence Control while you adjust the nut.

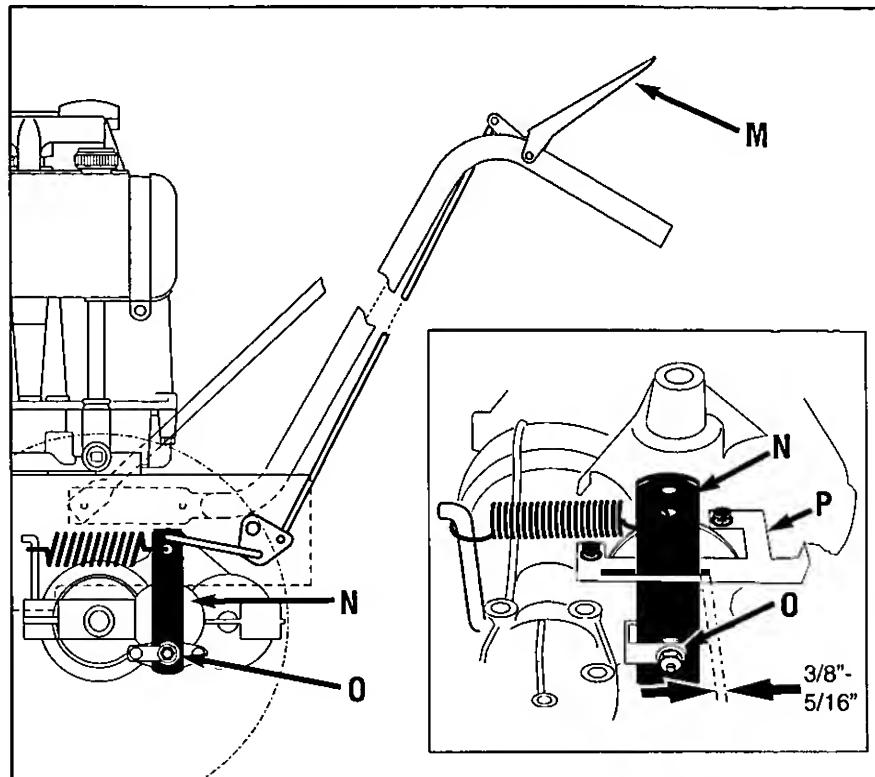


Figure 5-13: Wheel brake adjustment.

TRANSMISSION NEUTRAL ADJUSTMENT

Follow this procedure to adjust neutral on the transmission.

1. Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.

2. Rotate shift rod (I, Figures 5-14 and 5-15) clockwise until it stops in the neutral (N) position (from forward gear positions).

3. Hold down Operator Presence Control (M, Figure 5-13) and push unit forward and backward. Unit should move freely. If not, continue with Step 4.

4. Remove cotter pin securing shift link (P, Figure 5-15) to shift rod (I).

5. Move shift arm (X) back and forth as necessary into each detent until transmission is in neutral.
NOTE: Moving shift arm (X) clockwise all the way to the left, and then one notch back counter-clockwise, should put transmission

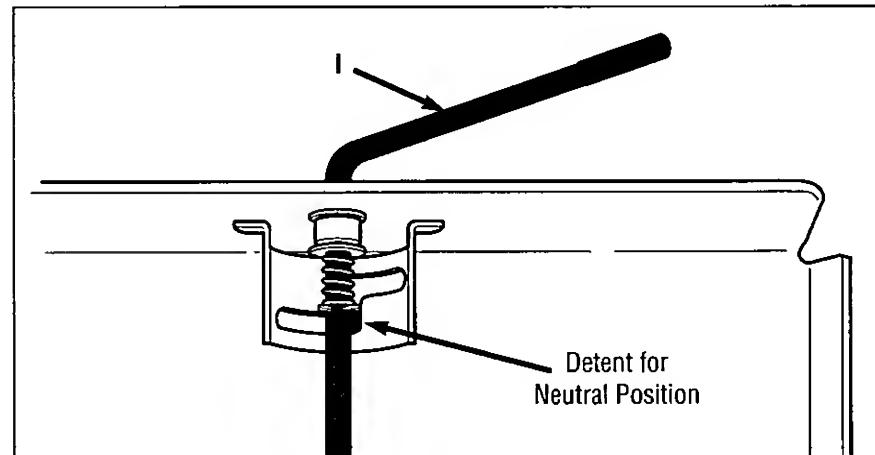


Figure 5-14: Gear Select Lever in neutral (N) position.

into neutral. When transmission is in neutral, unit will move freely when pushed while holding the Operator Presence Control lever down. If transmission is NOT in neutral, there will be a slight drag on the wheels when pushing unit.

6. When shift arm (X) is in neutral position, rotate shift link (P) until hooked end fits back into hole in bottom end of shift rod (I).

NOTE: Shift rod (I) must be held in the neutral position (see Figure 5-14) while shift link (P) is adjusted.

7. Secure shift link (P) into shift rod (I) with cotter pin removed earlier.

8. Re-check neutral by pushing unit back and forth and shifting lever (I) from reverse to neutral. A small fine-tune adjustment may be required.

MOWER BLADES

Examine mower blades before operation. For efficient mowing, cutting edges of blades should always be kept sharp. Check for blade wear or damage. See Figure 5-16. Replace a severely worn or damaged blade with a new one.



WARNING

Mower blades are sharp.

- When working near blades, wear heavy leather gloves or wrap blades in thick rags to protect yourself from the sharp edges.
- Wear eye protection when sharpening blades.

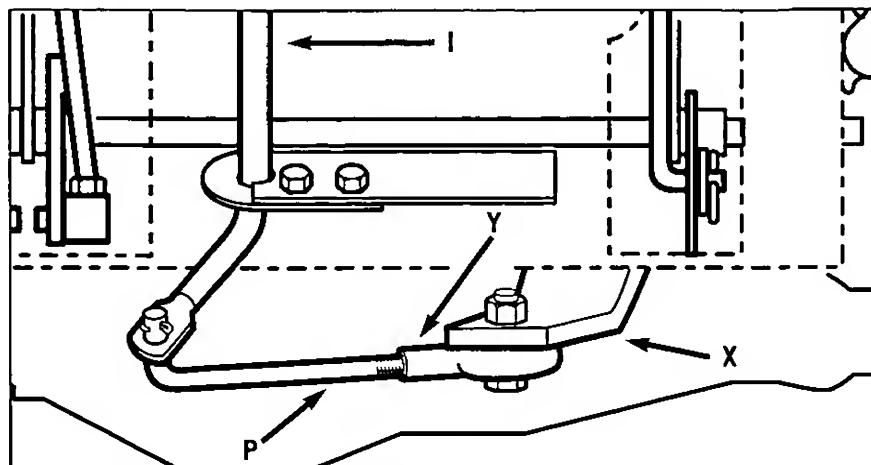


Figure 5-15: Transmission neutral (N) adjustment.

To Inspect Blades

1. Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.

2. Tip mower on rear wheels by following instructions "Tipping Mower For Service" in this Section of Manual.

To Remove Blade

Remove bolt (Figure 5-18) and washer(s). Remove mower blade.

Blade Sharpening

Grind or file the same amount from each blade end to maintain blade balance. An unbalanced mower blade produces excessive vibration and may damage spindle bearings. Sharpen cutting edge straight across, parallel to rear edge of mower blade. See Figure 5-16. After sharpening, blade balance must be checked.

IMPORTANT: Professional sharpening services or your local White Outdoor dealer are equipped to sharpen mower blades safely.

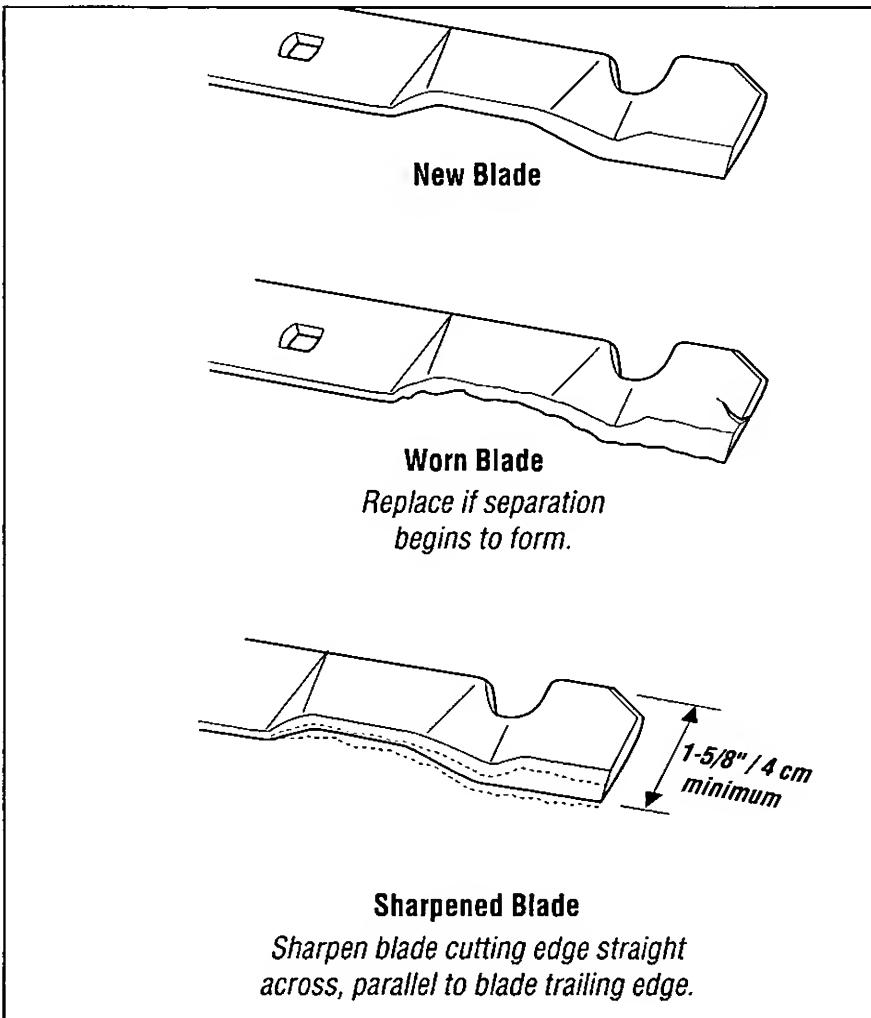


Figure 5-16: Blade Inspection

Maintenance

Blade Installation

Blades must be installed perpendicular to each other (see Figure 5-17).

Install mower blade as shown in Figure 5-18 with flat side down. Install washer on bolt. Tighten bolts to a torque value of 35 ft. lbs. (47 Nm).

NOTE: If top bolt is removed, reinstall using LOCTITE #242 thread sealant.

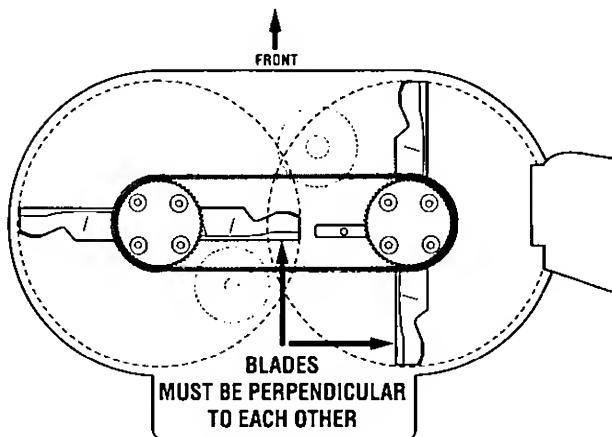


Figure 5-17

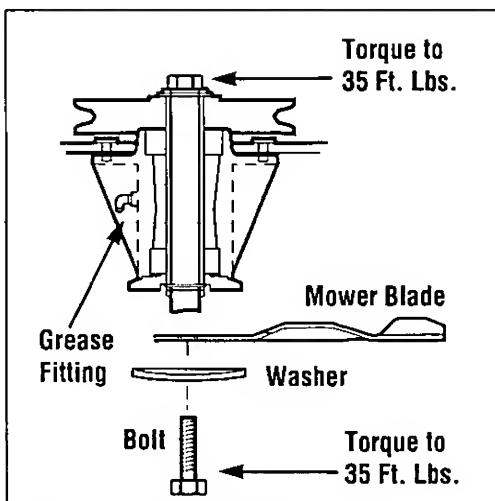


Figure 5-18: Blade spindle.

CLEANING UNDERSIDE OF MOWER DECK

Frequently check, and clean if necessary, the underside of the mower deck. Grass build-up in this area can affect the cutting performance. Before inspecting or cleaning, make sure that the engine is shut off and the spark plug wire is disconnected from the spark plug.



WARNING

Mower blades are sharp. When working near blades, wear heavy leather gloves or wrap blades in thick rags to protect yourself from the sharp edges.

Inspection/Cleaning of Mower Deck

1. Stop engine, wait for all parts to stop moving, and disconnect spark plug wire.
2. Tip mower on rear wheels by following instructions "Tipping Mower For Service" in this Section of Owner's Guide.
3. Use a plastic or metal scraper to remove grass build-up from deck or blades. If needed, spray with a garden hose.

LUBRICATION

Oil and grease the mower according to the recommendations listed in the Lubrication Chart below.

- *Stop engine, wait for all parts to stop moving, and disconnect spark plug wire before performing any lubrication procedures.*
- Blade spindle grease fittings are located on spindles under mower deck. Tip mower on rear wheels by following instructions "Tipping Mower For Service" in this Section of Owner's Guide. Clean fittings before greasing. Use a hand-type grease gun and multi-purpose grease.
- The transmission has been factory sealed and requires no lubrication. If a leak should develop, contact your local White Outdoor dealer for service information.

OFF-SEASON STORAGE

- *Stop engine, wait for all parts to stop moving, and disconnect spark plug wire before performing any storage procedures. Review the "Maintenance and Storage" safety rules in the Safety section of this Owner's Guide.*
- If engine will be unused for 30 days or more, prepare it for storage by following the recommended procedures found in the Engine Owner's Manual.
- Inspect all parts for damage, breakage, and wear. Tighten or replace fasteners. Contact your local White Outdoor dealer for factory-approved replacement parts.
- Clean the exterior of the mower thoroughly and touch up all chipped or scratched surfaces to prevent rust from forming.

**WARNING**

Never store machine with fuel in the fuel tank inside a building where fumes may reach an open flame or spark, or where ignition sources are present such as hot water and space heaters, furnaces, clothes dryers, stoves, electric motors, etc.

Lubrication Chart

ITEM	INTERVAL	LUBRICATION TYPE	AMOUNT REQUIRED
Engine Crankcase	First 2 hours	Change Oil	See Engine Manual
	25-50 hours	Change Oil (Lubrication Intervals Vary with Operating Conditions and Type of Oil Used)	Change oil more often in extremely dirty or dusty conditions.
Front Wheel Bearings	50 hours	Grease	1-3 Strokes*
Control Linkages/Pivots	25 hours	Light Oil	A Few Drops
Blade Spindle(s)	100 hours	Multi-purpose Grease	1-3 Strokes*
Transmission Output Shaft	100 hours or Annually	Grease	1-3 Strokes*

* A hand-type grease gun is recommended.

Maintenance

ATTENTION! This chart describes service guidelines only. It does not provide complete service information. Complete service is available from your local White Outdoor dealer. Before performing any of the maintenance procedures, refer to the appropriate information contained in this Owner's Guide or the Engine Owner's Manual for the correct safety precautions and maintenance procedures.



WARNING

Before inspecting, cleaning or servicing the machine, shut off engine, make sure that all moving parts have come to a complete stop, and disconnect spark plug wire.

Failure to follow this instruction could result in personal injury or property damage.

Maintenance Chart

INTERVAL*	ITEM	SERVICE
Each use	Mower Blade Loose or Missing Hardware Belts Engine Oil Level Controls Mulching Cover	As Required Tighten or Replace Check Check Check for Proper Operation Check for Proper Cover Installation
1st 2 hours	Engine Oil	Change
25 hours	Engine Oil**** Foam Air Filter***** Mower Blade(s) Control Linkages and Pivots	Change Clean Sharpen and Balance Lube with Light Oil
50 hours	Engine Oil**** Blade Drive Belt Adjust Engine Cooling Fins Grease Fittings**	Change Adjust Tension Clean Grease
Annually or 100 hours	Air Filter Element***** Spark Plug Mower Blade Spindle(s) Transmission Output Shaft	Replace Clean/Replace, Re-gap Grease Grease
Monthly	Linkages Belts	Adjust Check/Replace, Adjust
Annually or 50 hours	Front Wheel Bearings	Grease

*Interval describes running time.

**A hand-type grease gun is recommended when greasing your unit. High-pressure type grease guns could cause damage to fittings/seals.

***Consult engine manual for more detailed engine service information.

****Clean more often under dusty conditions or when airborne debris is present. Replace air cleaner parts, if very dirty.

ATTENTION! This table describes service guidelines only. It does not provide complete service information. Complete service is available from your local White Outdoor dealer. Before performing any of the corrections in this table, refer to the appropriate information contained in this Owner's Guide or the Engine Owner's Manual for the correct safety precautions and operating or maintenance procedures.



WARNING

Before inspecting, cleaning or servicing the machine, shut off engine, make sure that all moving parts have come to a complete stop, and disconnect spark plug wire.

Failure to follow this instruction could result in personal injury or property damage.

Troubleshooting Chart

Possible cause	Engine does not turn over.	Engine turns over but will not start.	Engine starts only after repeated tries.	Engine runs roughly.	Engine stalls in a few seconds.	Engine runs but unit does not move.	Wheel drive always engaged.	Engine stalls when hot.	Engine overheats.	Engine does not shut off.	Blade drive inoperative.	Blade drive always engaged.	Battery not charging (if applicable).	Poor mowing performance.	Blade does not stop when Operator Presence Control is released.	Excessive vibration.
Engine malfunction (refer to engine manual).	●	●	●	●	●			●	●	●						●
Improperly adjusted drive linkage.					●	●				●	●			●	●	●
Dirty engine cooling fins or flywheel screen.								●								
Faulty ignition.	●	●	●	●	●			●	●							
Faulty spark plug.	●	●	●	●					●							
Empty fuel tank.	●	●			●			●								
Battery or charging malfunction (if applicable).	●	●							●				●			
Improperly adjusted or dirty carburetor.	●	●	●	●					●							
Improper oil level.									●							●
Dirty air cleaner element.	●		●	●					●							
Improperly adjusted choke (if applicable).	●	●	●	●					●							
Transmission malfunction.					●	●										
Improperly adjusted drive linkage.					●	●					●	●				●
Broken, loose or worn belt(s).				●	●	●				●	●	●			●	●
Dull blade(s).																●
Throttle control out of adjustment.	●	●							●							
Blade/brake system out of adjustment.										●	●	●			●	
Blade(s) out of balance.													●		●	●
Loose hardware.										●	●					●

MANUFACTURER'S LIMITED WARRANTY FOR:



For TWO YEARS from the date of retail purchase within the United States of America, its possessions and territories, MTD PRODUCTS INC will, at its option, repair or replace, for the original purchaser, free of charge, any part or parts found to be defective in material or workmanship. This warranty covers units which have been operated and maintained in accordance with the operating instructions furnished with the unit, and which have not been subject to misuse, abuse, neglect, accident, improper maintenance or alteration.

NORMAL WEAR PARTS or components thereof are subject to separate terms as noted below in the "No Fault Ninety Day Consumer Warranty" clause. Commercial use is subject to the terms listed above, and is covered for a period of 90 days from the date of purchase.

TWO YEAR CONSUMER WARRANTY ON NORMAL WEAR PARTS WITH NINETY DAY NO FAULT PROTECTION: All normal wear parts failures will be covered on this product for a period of 90 days regardless of cause. After 90 days, but within the two year period, normal wear parts failures will be covered if caused by defects in materials or workmanship. Normal wear parts are defined as belts, blades, blade adapters, grass bags, rider deck wheels, seats, snow thrower skid shoes, shave plates and tires.

HOW TO OBTAIN SERVICE: Warranty service is available, with proof of purchase, through your local authorized service dealer. To locate the dealer in your area, please check the yellow pages or contact the Customer Service Department of MTD PRODUCTS INC, P. O. Box 361131, Cleveland, Ohio 44136-0019. Phone (330) 225-8883. The return of a complete unit will not be accepted by the factory unless prior written permission has been extended by the Service Department of MTD PRODUCTS INC.

TRANSPORTATION CHARGES: Transportation charges for the movement of any power equipment unit or attachment are the responsibility of the purchaser. Transportation charges for any parts submitted for replacement under this warranty must be paid

by the purchaser unless such return is requested by MTD PRODUCTS INC.

UNITS EXPORTED OUT OF THE UNITED STATES: MTD PRODUCTS INC does not extend any warranty for products sold or exported outside of the United States of America, its possessions and territories, except those sold through MTD PRODUCTS INC's authorized channels of export distribution.

OTHER WARRANTIES:

1. The engine or component parts thereof carry separate warranties from their manufacturers. Please refer to the applicable manufacturer's warranty on these items.
2. Batteries are covered by a 90-day replacement warranty.
3. Log splitter pumps, valves and cylinders or component parts thereof are covered by a one year warranty.
4. All other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular purpose, are hereby expressly disclaimed in their entirety.
5. The provisions as set forth in this warranty provide the sole and exclusive remedy of MTD PRODUCTS INC's obligations arising from the sales of its products. MTD PRODUCTS INC will not be liable for incidental or consequential loss or damage.

HOW STATE LAW RELATES TO THIS WARRANTY: This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Certain disclaimers are not allowed in some states and therefore they may not apply to you under all circumstances.

NOTE: This warranty does not cover set-up, routine maintenance items such as lubricants, filters, blade sharpening and tune-ups, or adjustments such as brake adjustments. Nor does this warranty cover normal deterioration of the exterior finish due to use or exposure.